IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

Los Angeles Times Article: Ample water amid drought
A historic rule enables Imperial Valley to tap Colorado River March 17, 2014by T**ony Perry** (Rockwood Canal)

May 5, 2014 and May 6, 2014
Exceptional Event Documentation
For the Imperial County PM_{10} Nonattainment Area

FINAL REPORT

August 22, 2018

TABLE OF CONTENTS

SECTION PAGE

LIST OF FIGURES

FIGURE PAGE

LIST OF TABLES

TABLE **PAGE**

ACRONYM DESCRIPTIONS

AOD	Aerosol Optical Depth
AQI	Air Quality Index
AQS	Air Quality System
BACM	Best Available Control Measures
BAM 1020	Beta Attenuation Monitor Model 1020
BLM	United States Bureau of Land Management
BP	United States Border Patrol
CAA	Clean Air Act
CARB	California Air Resources Board
CMP	Conservation Management Practice
DCP	Dust Control Plan
DPR	California Department of Parks and Recreation
EER	Exceptional Events Rule
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GOES-W/E	Geostationary Operational Environmental Satellite (West/East)
HC	Historical Concentrations
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory Model
ICAPCD	Imperial County Air Pollution Control District
INPEE	Initial Notification of a Potential Exceptional Event
ITCZ	Inter Tropical Convergence Zone
KBLH	Blythe Airport
KCZZ	Campo Airport
KIPL	Imperial County Airport
KNJK	El Centro Naval Air Station
KNYL/MCAS	Yuma Marine Corps Air Station
KPSP	Palm Springs International Airport
KTRM	Jacqueline Cochran Regional Airport (aka Desert Resorts Rgnl Airport)
LST	Local Standard Time
MMML/MXL	Mexicali, Mexico Airport
MODIS	Moderate Resolution Imaging Spectroradiometer
MPH	Miles Per Hour
MST	Mountain Standard Time
NAAQS	National Ambient Air Quality Standard
NCAR	National Center for Atmospheric Research
NCEI	National Centers for Environmental Information
NEAP	Natural Events Action Plan
NEXRAD	Next-Generation Radar
NOAA	National Oceanic and Atmospheric Administration
nRCP	Not Reasonably Controllable or Preventable
NWS	National Weather Service

PDT	Pacific Daylight Time
PM_{10}	Particulate Matter less than 10 microns
$PM_{2.5}$	Particulate Matter less than 2.5 microns
PST	Pacific Standard Time
QA/QC	Quality Assured and Quality Controlled
QCLCD	Quality Controlled Local Climatology Data
RACM	Reasonable Available Control Measure
RAWS	Remote Automated Weather Station
SIP	State Implementation Plan
SLAMS	State Local Ambient Air Monitoring Station
SMP	Smoke Management Plan
SSI	Size-Selective Inlet
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTC	Coordinated Universal Time
WRCC	Western Regional Climate Center

I Introduction

On May 5, 2014 and May 6, 2014, State and Local Ambient Air Monitoring Stations (SLAMS), located in Brawley (AQS Site Code 060250007), and Westmorland (AQS Site Code 060254003), California measured an exceedance of the National Ambient Air Quality Standard (NAAQS). Both Federal Referenced Method (FRM) Size-Selective Inlet (SSI) Hi Volume Gravimeter samplers and Federal Equivalent Method (FEM), Beta Attenuation Monitor Model 1020s (BAM 1020) measured a (midnight to midnight) 24-hour (hr) average Particulate Matter less than 10 microns (PM_{10}) concentration of 269 µg/m^3, 222 µg/m^3, 375 µg/m^3 and 438 µg/m^3. PM_{10} 24-hr measurements above the 150 µg/m^3 are exceedances of the NAAQS. The SLAMS in Brawley and Westmorland were the only stations in Imperial County to measure an exceedance of the PM_{10} NAAQS on May 5, 2014 and May 6, 2014.

TABLE 1-1
CONCENTRATIONS OF PM_{10} ON MAY 5, 2014 AND MAY 6, 2014

DATE	MONITORING SITE	AQS ID	POC(s)	HOURS	24-HOUR CONCENTRATION µg/m^3	PM_{10} NAAQS µg/m^3
5/5/2014	**Brawley**	**06-025-0007**	**1**	**24**	**269**	**150**
5/5/2014	**Brawley**	**06-025-0007**	**3**	**22**	**222**	**150**
5/5/2014	**Westmorland**	**06-025-4003**	**1**	**24**	**375**	**150**
5/6/2014	**Brawley**	**06-025-0007**	**3**	**23**	**438**	**150**
5/5/2014	Calexico	06-025-0005	1	24	86	150
5/5/2014	El Centro	06-025-1003	2	24	87	150
5/5/2014	Niland	06-025-4004	1	24	121	150
5/5/2014	Niland	06-025-4004	3	18	100	150
5/6/2014	Niland	06-025-4004	3	**12**	*208	150

All time referenced throughout this document is in Pacific Standard Time (PST) unless otherwise noted[1]
May 6, 2014 was not scheduled sampling day: For Niland on May 6, 2014 the concentration of 208 is not a 24-hour average thus not an exceedance-regulatory requirements provide for a minimum of a 75% capture rate[2]

The Imperial County Air Pollution Control District (ICAPCD) has been submitting PM_{10} data from FRM SSI instruments since 1986 into the United States Environmental Protection Agency's (USEPA) Air Quality System (AQS). Prior to 2013 all continuous measured PM_{10} data was non-regulatory, thus measured in local conditions. However, by 2013 ICAPCD began formally submitting continuous FEM PM_{10} data from BAM 1020's into the USEPA managed AQS. Because regulatory consideration of reported data must be in standard conditions, as required by USEPA,

[1] According to the National Institute of Standards and Technology (NIST) Time and Frequency Division the designation of the time of day for specific time zones are qualified by using the term "standard time" or "daylight time". For year-round use the designation can be left off inferring "local time" daylight or standard whichever is present. For 2014, Pacific Daylight Time (PDT) is March 9 through November 2. https://www.nist.gov/pml/time-and-frequency-division/local-time-faqs#intl

[2] On May 5, 2014 and May 6, 2014, the Niland monitor failed to meet critical criteria requirements causing the invalidation of 18 hours of measured concentrations. USEPA requires a 75% capture rate for any given daily averaged concentration. While the Niland monitor captured 75% of the 24-hour daily average for May 5, 2014, the capture rate was not met for May 6, 2014 making the 12-hour average of 208 µg/m^3 not an exceedance.

all continuous PM_{10} data since 2013 is regulatory. On May 5, 2014 and May 6, 2014, strong and gusty west winds ahead of a late season deep trough of low-pressure that moved down and into Southern California, transported windblown dust elevating particulate matter affecting air quality and causing an exceedance at the Westmorland and Brawley monitors in Imperial County.

This report demonstrates that a naturally occurring event caused an exceedance observed on May 5, 2014 and May 6, 2014, which elevated particulate matter and affected air quality. The report provides concentration to concentration monitoring site analyses supporting a clear causal relationship between the event and the monitored exceedances and provides an analysis supporting the not reasonably controllable or preventable (nRCP) criteria. Furthermore, the report provides information that the exceedances would not have occurred without the entrainment of fugitive windblown dust from outlying deserts and mountains within the Sonoran Desert. The document further substantiates the request by the ICAPCD to exclude PM_{10} 24-hour NAAQS exceedances of 269 $\mu g/m^3$, 222 $\mu g/m^3$, 375 $\mu g/m^3$ and 438 $\mu g/m^3$ as an exceptional event. This demonstration substantiates that this event meets the definition of the USEPA Regulation for the Treatment of Data Influenced by Exceptional Events (EER)[3].

I.1 Demonstration Contents

Section II - Describes the May 5, 2014 and May 6, 2014 event as it occurred in California and into Imperial County, providing background information of the exceptional event and explaining how the event affected air quality. Overall, this section provides the evidence that the event was a natural event.

Section III – Using time-series graphs, summaries and historical concentration comparisons of the Brawley and Westmorland stations this section discusses and establishes how the May 5, 2014 and May 6, 2014 event affected air quality such that a clear causal relationship is demonstrated between the event and the monitored exceedance. It is perhaps of some value to mention that the time-series graphs include PM_{10} data measured in both local conditions and standard conditions. Measured PM_{10} continuous data prior to 2013 is in local conditions, all other data is in standard conditions. The concentration difference between local and standard conditions has an insignificant impact on any data analysis. Overall, this section provides the evidence that human activity played little or no direct causal role in the May 5, 2014 and May 6, 2014 event and its resulting emissions defining the event as a "natural event".[4]

Section IV - Provides evidence that the event of May 5, 2014 and May 6, 2014 was not reasonably controllable or preventable despite the full enforcement and implementation of Best Available Control Measures (BACM).

[3] "Treatment of Data Influenced by Exceptional Events; Final Guidance", 81 FR 68216, October 2, 2016

[4] Title 40 Code of Federal Regulations part 50: §50.1(k) Natural event means an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.

Section V - Brings together the evidence presented within this report to show that the exceptional event affected air quality; that the event was not reasonably controllable or preventable; that there was a clear causal relationship between the event and the exceedance, and that the event was a natural event.

I.2 Requirements of the Exceptional Event Rule

The above sections combined comprise the technical requirements described under the Exceptional Events Rule (EER) under 40 CFR §50.14(c)(3)(iv). However, in order for the USEPA to concur with flagged air quality monitoring data, there are additional non-technical requirements.

I.2.a Public Notification that a potential event was occurring (40 CFR §50.14(c)(1))

The ICAPCD provided the National Weather Service (NWS) weather discussion via the ICAPCD's webpage for May 5, 2014 and May 6, 2014. The ICAPCD notification included forecast information indicating that windy conditions for May 5, 2014 and May 6, 2014 along with patchy blowing dust were possible. On May 5, 2014, the ICAPCD advised individuals that the NWS issued wind advisories advising of strong and gusty westerly winds as a late season storm approached Southern California. Because of the potential for suspended particles and poor air quality, the ICAPCD issued a "No Burn" day advisory for Imperial County on May 5, 2014 and May 6, 2014. **Appendix A** contains copies of notices pertinent to the May 5, 2014 and May 6, 2014 event.

I.2.b Initial Notification of Potential Exceptional Event (INPEE) (40 CFR §50.14(c)(2))

States are required under federal regulation to submit measured ambient air quality data into the AQS. AQS is the federal repository of Quality Assured and Quality Controlled (QA/QC) ambient air data used for regulatory purposes. When States intend to request the exclusion of one or more exceedances of a NAAQS as an exceptional event a notification to the Administrator is required. Notification occurs when an agency submits a request, which includes an initial event description, for flagging data in AQS.

On October 3, 2016, the US EPA promulgated revisions to the Exceptional Events rule, which included the requirement of an "Initial Notification of Potential Exceptional Event" (INPEE) process. This revised INPEE process requires communication between the US EPA regional office and the State, prior to the development of a demonstration. The intent of the INPEE process is twofold: to determine whether identified data may affect a regulatory decision and whether a State should develop/submit an EE Demonstration.

The ICAPCD made two separate written requests to the California Air Resources Board (CARB) to place preliminary flags on SLAMS measured concentrations from the Westmorland and Brawley monitors. The first request dated May 28, 2015 requested initial flags for both FRM and FEM data measurements for Westmorland and Brawley. The second request dated June 24, 2015 corrected FEM data that was originally submitted in local conditions to standard conditions. Reporting in standard conditions is required by US EPA when data is considered for regulatory

purposes. **Table 1-1** above provides the corrected concentrations for both Westmorland and Brawley. The difference in concentrations has an insignificant impact on any data analysis. In both instances a brief description of the meteorological conditions was provided to CARB which provided preliminary information that indicated a potential natural event had occurred on May 5, 2014 and May 6, 2014.

I.2.c Documentation that the public comment process was followed for the event demonstration that was flagged for exclusion (40 CFR §50.14(c)(3)(v))

The ICAPCD posted, for a 30 day public review, a draft version of this demonstration on the ICAPCD webpage and published a notice of availability in the Imperial Valley Press on January 10, 2018. The notice advised the public that comments were being solicited regarding the demonstration, which supports the request, by the ICAPCD, to exclude the measured concentrations of 269 µg/m3, 222 µg/m3, 375 µg/m3, and 438 µg/$m^{3,}$ which occurred on May 5, 2014 and May 6, 2014 in Westmorland and Brawley. The final closing date for comments was February 12, 2018. **Appendix A** contains a copy of the public notice affidavit along with any comments received by the ICAPCD for submittal as part of the demonstration (40 CFR §50.14(c)(3)(i)).

I.2.d Documentation submittal supporting an Exceptional Event Flag (40 CFR §50.14(c)(3)(i))

States that have flagged data as a result of an exceptional event and who have requested an exclusion of said flagged data are required to submit a demonstration that justifies the data exclusion to the USEPA in accordance with the due date established by USEPA during the INPEE process (40 CFR §50.14(c)(2)(i)). Currently, bi-weekly meetings between USEPA, CARB and Imperial County are set to discuss each flagged exceedance for 2016.

The ICAPCD, after the close of the comment period and after consideration of the comments will submit this demonstration along with all required elements, including received comments and responses to USEPA Region 9 in San Francisco, California. The submittal of the May 5, 2014 and May 6, 2014 demonstration will have a regulatory impact upon the development and ultimate submittal of the PM_{10} State Implementation Plan for Imperial County in 2018.

I.2.e Necessary demonstration to justify an exclusion of data under (40 CFR§50.14(c)(3)(iv))

A This demonstration provides evidence that the event, as it occurred on May 5, 2014 and May 6, 2014, satisfies the definition in 40 CFR §50.1(j) and (k) for an exceptional event.

a The event created the meteorological conditions that entrained emissions and caused the exceedance.
b The event clearly "affects air quality" such that there exists a clear causal relationship between the event and the exceedance.

c Analysis demonstrates that the event influenced concentrations compared to concentrations at the same monitor at other times supports the clear causal relationship.
d The event "is not reasonably controllable and not reasonably preventable."
e The event is "caused by human activity that is unlikely to recur at a particular location or [is] a natural event."
f The event is a "natural event" where human activity played little or no direct causal role.

B This demonstration provides evidence that the exceptional event affected air quality in Imperial County by demonstrating a clear causal relationship between the event and the measured concentrations in Brawley and Westmorland.

C This demonstration provides evidence of the event influenced monitor site measured concentrations to concentrations at the same monitor at other times supporting the clear causal relationship.

II May 5, 2014 and May 6, 2014 Conceptual Model

This section provides a summary description of the meteorological and air quality conditions under which the May 5, 2014 and May 6, 2014 event unfolded in Imperial County. The subsection elements include

- » A description and map of the geographic setting of the air quality and meteorological monitors
- » A description of Imperial County's climate
- » An overall description of meteorological and air quality conditions on the event day.

II.1 Geographic Setting and Monitor Locations

According to the United States Census Bureau, Imperial County has a total area of 4,482 square miles of which 4,177 square miles is land and 305 square miles is water. Much of Imperial County is below sea level and is part of the Colorado Desert an extension of the larger Sonoran Desert **(Figure 2-1)**. The Colorado Desert not only in includes Imperial County but a portion of San Diego County.

FIGURE 2-1
COLORADO DESERT AREA IMPERIAL COUNTY

Fig 2-1: 1997 California Environmental Resources Evaluation System. According to the United States Geological Survey (USGS) Western Ecological Research Center the Colorado Desert bioregion is part of the bigger Sonoran Desert Bioregion which includes the Colorado Desert and Upper Sonoran Desert sections of California and Arizona, and a portion of the Chihuahuan Basin and Range Section in Arizona and New Mexico (Forest Service 1994)

A notable feature in Imperial County is the Salton Sea, which is at approximately 235 feet below sea level. The Chocolate Mountains are located east of the Salton Sea and extend in a northwest-southeast direction for approximately 60 miles **(Figure 2-2)**. In this region, the geology is dominated by the transition of the tectonic plate boundary from rift to fault. The southernmost strands of the San Andreas Fault connect the northern-most extensions of the East Pacific rise. Consequently, the region is subject to earthquakes and the crust is being stretched, resulting in a sinking of the terrain over time.

FIGURE 2-2
SURROUNDING AREAS OF THE SALTON SEA

Fig 2-2: Image courtesy of the Image Science and Analysis Laboratory NASA Johnson Space Center, Houston Texas

All of the seven incorporated cities, including the unincorporated township of Niland, are surrounded by agricultural fields to the north, east, west and south **(Figure 2-6)**. Together, the incorporated cities, including Niland, and the agricultural fields make what is known as the Imperial Valley. Surrounding the Imperial Valley are desert areas found on the eastern and western portions of Imperial County.

The desert area, found within the western portion of Imperial County is of note because of its border with San Diego County. From west to east, San Diego County stretches from the Pacific Ocean to its boundary with Imperial County. San Diego County has a varied topography. On its western side is 70 miles (110 km) of coastline. Most of San Diego between the coast and the Laguna Mountains consists of hills, mesas, and small canyons. Snow-capped (in winter)

mountains rise to the northeast, with the Sonoran Desert to the far east. Cleveland National Forest is spread across the central portion of the county, while the Anza-Borrego Desert State Park occupies most of the northeast. The southeastern portion of San Diego County is comprised of distinctive Peninsular mountain ranges. The mountains and deserts of San Diego comprise the eastern two-thirds of San Diego County and are primarily undeveloped back county with a native plant community known as chaparral. Of the nine major mountain ranges within San Diego County, the In-Ko-Pah Mountains and the Jacumba Mountains border Mexico and Imperial County.

Both mountain ranges provide the distinctive weathered dramatic piles of residual boulders that are visible while driving on Interstate 8 from Imperial County through Devil's Canyon and In-Ko-Pah Gorge. Interstate 8 runs along the US border with Mexico from San Diego's Mission Bay to just southeast of Casa Grande Arizona.

FIGURE 2-3
JACUMBA PEAK

Fig 2-3: The Jacumba Mountains reach an elevation of 4,512 feet (1,375 m) at Jacumba Peak, near the southern end of the chain. Source: Wikipedia at https://en.wikipedia.org/wiki/Jacumba_Mountains

Northwest and northeast of the Jacumba Mountains is the Tierra Blanca Mountains, the Sawtooth Mountains and Anza-Borrego Desert State Park. Within the mountain ranges and the Anza-Borrego Desert State Park, there exists the Vallecito Mountains, the Carrizo Badlands, the Carrizo Impact Area, Coyote Mountains and the Volcanic Hills to name of few. Characteristically, these areas all have erosion that has occurred over time that extends from the Santa Rosa Mountains into northern Baja California in Mexico. For example, the Coyote Mountains consists of sand dunes left over from the ancient inland Sea of Cortez. Much of the terrain is still loose dirt, interspersed with sandstone and occasional quartz veins. The nearest community to the Coyote Mountain range is the community of Ocotillo. Of interest are the fossilized and hollowed out sand dunes that produce wind caves.

FIGURE 2-4
ANZA-BORREGO DESERT STATE PARK
CARRIZO BADLANDS

Fig 2-4: View southwest across the Carrizo Badlands from the Wind Caves in Anza-Borrego Desert State Park. Source: Wikipedia at https://en.wikipedia.org/wiki/Carrizo_Badlands

The Carrizo Badlands, which includes the Carrizo Impact Area used by the US Navy as an air-to-ground bombing range during World War II and the Korean War, lies within the Anza-Borrego Desert State Park. The Anza-Borrego Desert State Park is located within the Colorado Desert, is the largest state park in California occupying eastern San Diego County, reaching into Imperial and Riverside counties. The two communities within Anza-Borrego Desert State Park are Borrego Springs and Shelter Valley.

The Anza-Borrego Desert State Park lies in a unique geologic setting along the western margin of the Salton Trough. The area extends north from the Gulf of California to San Gorgonio Pass and from the eastern rim of the Peninsular Ranges eastward to the San Andreas Fault zone along the far side of the Coachella Valley. The Anza-Borrego region changed gradually over time from intermittently being fed by the Colorado River Delta to dry lakes and erosion from the surrounding mountain ranges. The area located within the southeastern and northeastern section of San Diego County is a source of entrained fugitive dust emissions that impact Imperial County when westerly winds funnel through the unique landforms causing in some cases wind tunnels that cause increases in wind speeds.

Historical observations have indicated that the desert slopes and mountains of San Diego are a source of fugitive emissions along with those deserts located to the east and west of Imperial County, which extend into Mexico (Sonoran Desert, **Figure 2-7**). Combined, the desert areas and mountains of San Diego and the desert areas that extend into Mexico are sources of dust emissions, which affect the Imperial County during high wind events.

FIGURE 2-5
ANZA-BORREGO DESERT STATE PARK
DESERT VIEW FROM FONT'S POINT

Fig 2-5: Desert view from Font's Point. Source: Font's Point Anza-Borrego Photographed by and copyright of (c) David Corby; Wikipedia at https://en.wikipedia.org/wiki/Anza-Borrego_Desert_State_Park

FIGURE 2-6
LOCATION AND TOPOGRAPHY OF IMPERIAL COUNTY

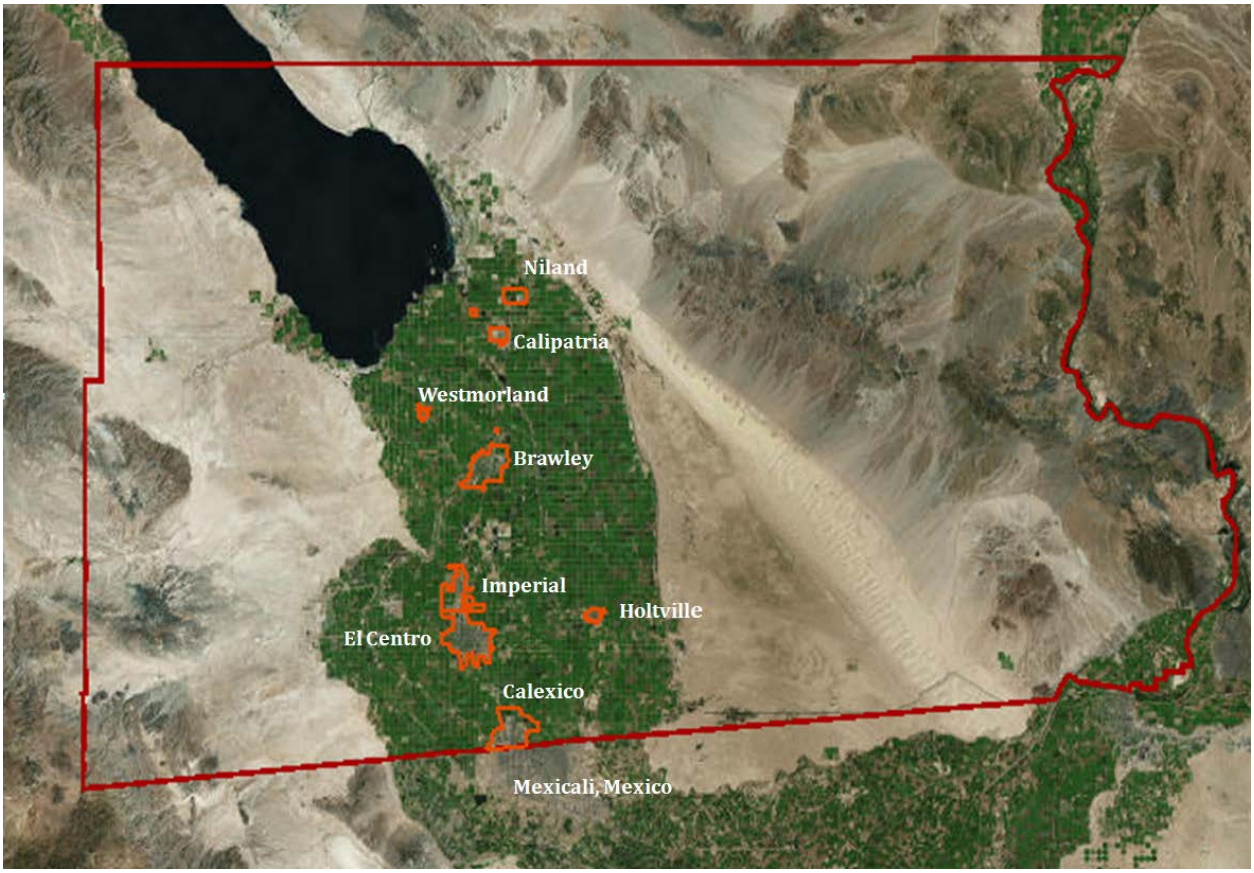

Fig 2-6: Depicts the seven incorporated cities within Imperial County - City of Calipatria, City of Westmorland, City of Brawley, City of Imperial, City of El Centro, City of Holtville, City of Calexico. Niland is unincorporated. Mexicali, Mexico is to the south

FIGURE 2-7
DESERTS IN CALIFORNIA, YUMA AND MEXICO

Fig 2-7: Depicts the Sonoran Desert as it extends from Mexico into Imperial County. Source: Google Earth Terra Matrics

The air quality and meteorological monitoring stations used in this demonstration are shown in **Figure 2-8**. Of the five SLAMS within Imperial County four stations measure both meteorological and air quality data. These SLAMS are located in Calexico, El Centro, Westmorland, and Niland; the station located in Brawley only measures air quality. Other air monitoring stations measuring air quality and meteorological data used for this demonstration include stations in eastern Riverside County, southeastern San Diego County and southwestern Arizona (Yuma County) **(Figure 2-8 and Table 2-1)**.

As mentioned above, the PM_{10} exceedance on May 5, 2014 and May 6, 2014, occurred at the Westmorland and Brawley stations. The Westmorland and Brawley stations are regarded as the "northern" monitoring sites within the Imperial County air monitoring network. In order to properly analyze the contributions from meteorological conditions occurring on May 5, 2014 and May 6, 2014, various other meteorological sites were used such as airport in eastern Riverside County, southeastern San Diego County, southwestern Arizona (Yuma County), Imperial County, and other sites when relevant to the wind event, such as within northern Mexico. **(Figure 2-8 and Appendix B)**.

FIGURE 2-8
MONITORING SITES IN AND AROUND IMPERIAL COUNTY

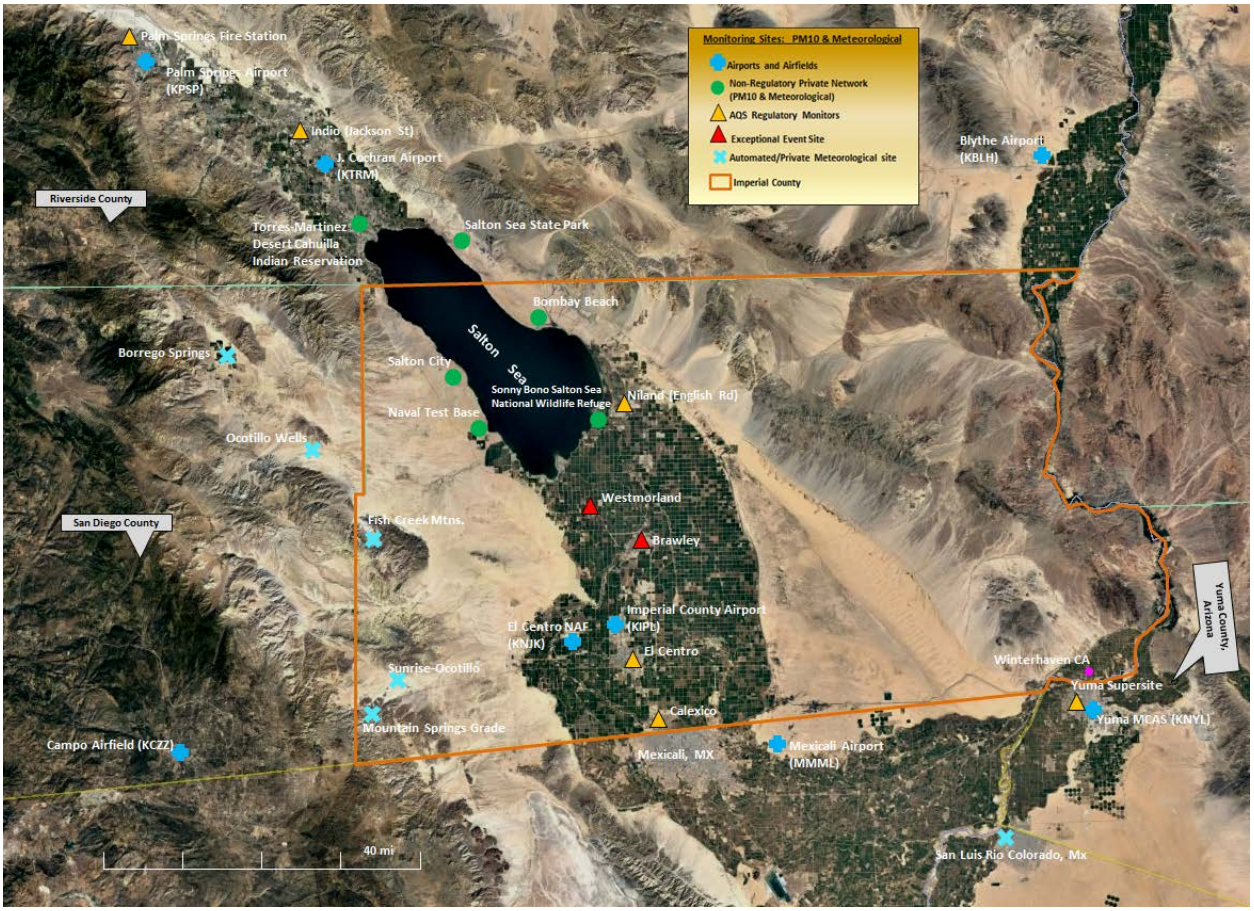

Fig 2-8: Depicts a select group of meteorological and PM_{10} monitoring sites in Imperial County, eastern Riverside County, southeastern San Diego County, southwestern Arizona (Yuma County), and northern Mexico. The image provides the location of potential sites used to gather data in support of an Exceptional Event Demonstration. Source: Google Earth

In addition to meteorological sites, there are non-regulatory PM_{10} sites located around the Salton Sea that maybe referenced as an aid to help the reader understand the direction and velocity of winds that affect Imperial County. Unless, otherwise specifically indicated concentration references do not imply emissions from the surrounding playa of the Salton Sea. Three sites, in specific, are the Salton City air monitoring station, the Naval Test Base air monitoring station and the Sonny Bono air monitoring station. These stations are privately owned and non-regulatory (**Figures 2-9 to 2-12**). The Salton City station is located 33.27275°N latitude and 115.90062˚W longitude, on the western edge of the Salton Sea (**Figure 2-9**). The station abuts a water reservoir along the Salton Sea with surrounding chaparral vegetation and unpaved open areas and roads. The Naval Test Base station is located 33.16923°N latitude and 115.85593˚W longitude, on the southwestern edge of the Salton Sea (**Figure 2-11**). The station sits on an abandoned US Military site, still owned by the Department of Defense. Unlike the Salton City station, light chaparral vegetation and sandy open dune areas surround the Naval Test Base station. Directly to the west

of the station is an orchard. The Sonny Bono station is located 33.17638°N latitude and 115.62310˚W longitude, on the southern portion of the Salton Sea within the Sonny Bono Salton Sea Wildlife Refuge. The Sonny Bono Salton Sea National Wildlife Refuge is 40 miles north of the Mexican border at the southern end of the Salton Sea within the Sonoran Desert. The Refuge has two separate managed units, 18 miles apart. Each unit contains wetland habitats, farm fields, and tree rows. The land of the Salton Sea Refuge is flat, except for Rock Hill, a small, inactive volcano, located near Refuge Headquarters. Bordering the Refuge is the Salton Sea on the north and farmlands on the east, south, and west.

FIGURE 2-9
SALTON CITY AIR MONITORING STATION

Fig 2-9: Depicts the Salton City air monitoring (circled) site operated by a private entity. Site photos can be seen at the California Air Resources Board monitoring website at https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-10
SALTON CITY AIR MONITORING STATION
WEST

Fig 2-10: Photograph taken by the California Air Resources Board audit team in 2017. The photograph is taken from the west facing the probe. https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-11
NAVAL TEST BASE AIR MONITORING STATION

Fig 2-11: Depicts the Naval Test Base air monitoring (circled) site operated by a private entity. To view the site photos visit the California Air Resources Board monitoring website at https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13603&date=17

FIGURE 2-12
NAVAL TEST BASE AIR MONITORING STATION
WEST

Fig 2-12: Photograph taken by the California Air Resources Board audit team in 2017. The photograph is taken from the west facing the probe. https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-13
SONNY BONO AIR MONITORING STATION

Fig 2-13: Depicts the Sonny Bono air monitoring (circled) site operated by a private entity. To view the site photos visit the California Air Resources Board monitoring website at https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-14
SONNY BONO SALTON SEA NATIONAL WILDLIFE REFUGE

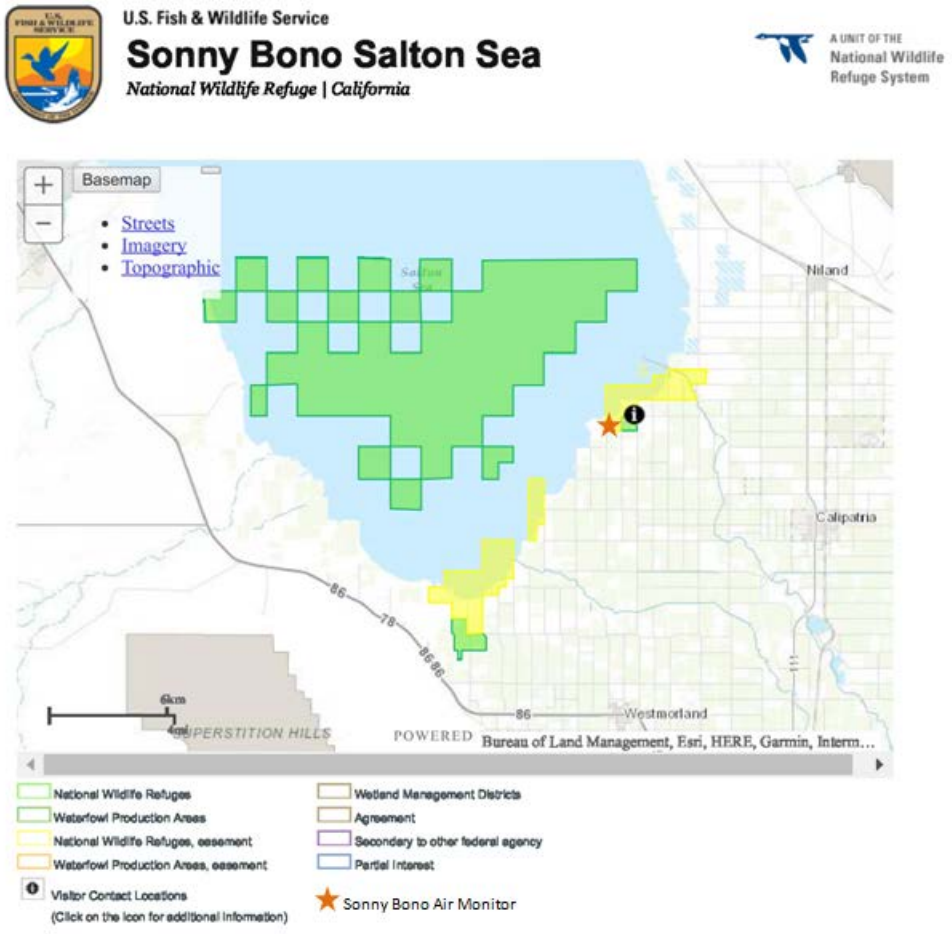

Fig 2-14: The Sonny Bono Wildlife Refuge has about 2,000 acres that are farmed and managed for wetlands. In 1998, the Refuge was renamed after Congressman Sonny Bono, who helped inform the U.S. Congress of the environmental issues facing the Salton Sea as well as acquiring funding for this Refuge to help it respond to avian disease outbreaks and other habitat challenges at the Salton Sea. Source: https://www.fws.gov/refuge/Sonny_Bono_Salton_Sea/about.html

TABLE 2-1
MONITORING SITES IN IMPERIAL COUNTY, RIVERSIDE COUNTY AND ARIZONA
MAY 5, 2014 AND MAY 6, 2014

Monitor Site Name	*Operator	Monitor Type	AQS ID	AQS PARAMETER CODE	ARB Site Number	Elevation (meters)	Day	24-hr PM_{10} ($\mu g/m^3$) Avg	1-hr PM_{10} ($\mu g/m^3$) Max	**Time of Max Reading	Max Wind Speed (mph)	**Time of Max Wind Speed
IMPERIAL COUNTY												
Brawley-Main Street #2	ICAPCD	Hi-Vol Gravimetric	06-025-0007	(81102)	13701	-15	5	269	-	-	-	-
		BAM 1020						222.5	825.1	16:00		
		Hi-Vol Gravimetric					6	-	-	-	-	-
		BAM 1020						439.3	945.7	5:00		
Calexico-Ethel Street	CARB	Hi-Vol Gravimetric	06-025-0005	(81102)	13698	3	5	86	-	-	16.5	15:00
							6	-	-	-	22.1	12:00
El Centro-9th Street	ICAPCD	Hi-Vol Gravimetric	06-025-1003	(81102)	13694	9	5	87	-	-	15.2	23:00
							6	-	-	-	20.5	5:00
Niland-English Road	ICAPCD	Hi-Vol Gravimetric	06-025-4004	(81102)	13997	-57	5	121	-	-	24.5	21:00
		BAM 1020						100.6	321.7	20:00		
		Hi-Vol Gravimetric					6	-	-	-	28.8	9:00
		BAM 1020						208.7	440.3	13:00		
Westmorland	ICAPCD	Hi-Vol Gravimetric	06-025-4003	(81102)	13697	-43	5	375	-	-	-	-
							6	-	-	-	-	-
RIVERSIDE COUNTY												
Palm Springs Fire Station	SCAQMD	TEOM	06-065-5001	(81102)	33137	174	5	33	69	12:00	-	-
							6	22.6	73	16:00	-	-
Indio (Jackson St.)	SCAQMD	TEOM	06-065-2002	(81102)	33157	1	5	49	120	23:00	-	-
							6	40.3	145	17:00	-	-
ARIZONA – YUMA												
Yuma Supersite	ADEQ	TEOM	04-027-8011	(81102)	N/A	60	5	75	247	23:00	-	-
							6	375.8	1376	7:00	-	-

*CARB = California Air Resources Board
*ICAPCD = Air Pollution Control District, Imperial County
*SCAQMD = South Coast Air Management Quality District
*ADEQ =Arizona Department of Environmental Quality

**Time represents the actual time/hour of the measurement in question according to the zone time (PST unless otherwise noted)

II.2 Climate

As mentioned above, Imperial County is part of the Colorado Desert, which is a subdivision of the larger Sonoran Desert (**Figure 2-15**) encompassing approximately 7 million acres (28,000 km^2). The desert area encompasses Imperial County and includes parts of San Diego County, Riverside County, and a small part of San Bernardino County.

FIGURE 2-15
SONORAN DESERT REGION

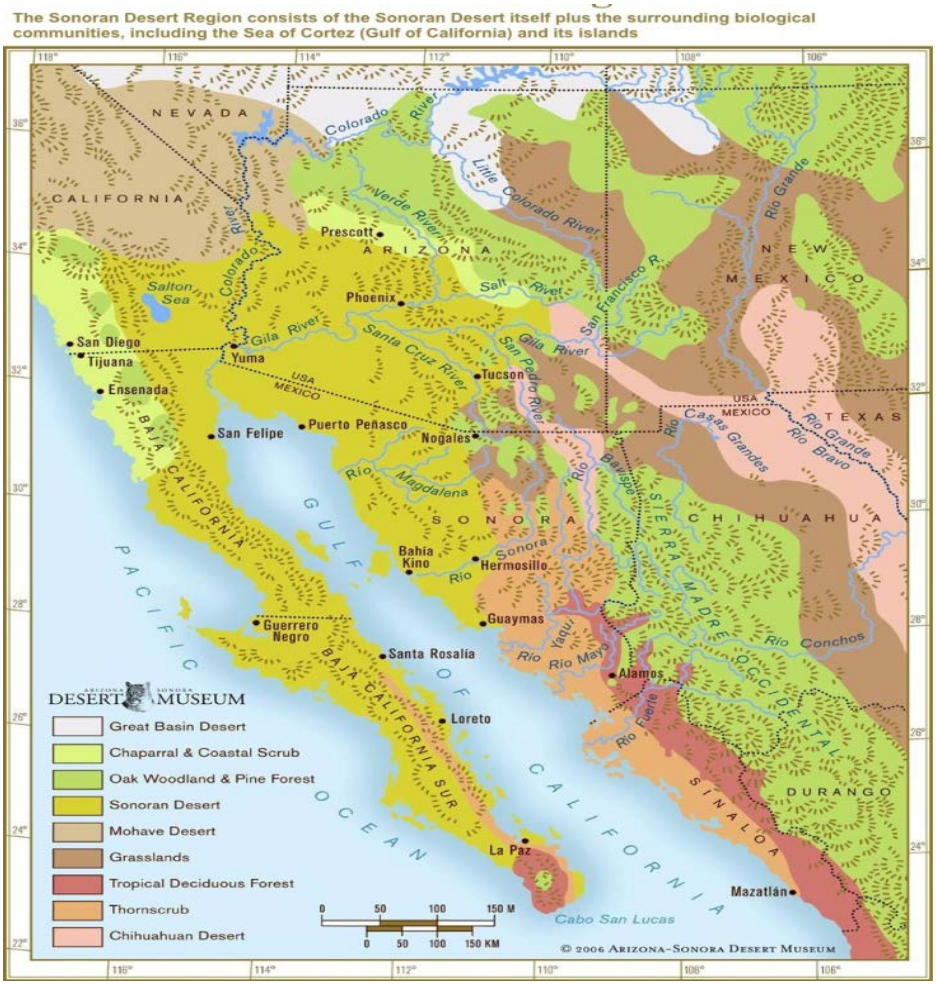

Fig 2-15: Depicts the magnitude of the region known as the Sonoran Desert. Source: Arizona-Sonora Desert Museum at http://desertmuseum.org/center/map.php

The majority of the Colorado Desert lies at a relatively low elevation, below 1,000 feet (300 m), with the lowest point of the desert floor at 275 feet (84 m) below sea level at the Salton Sea. Although the highest peaks of the Peninsular Range reach elevations of nearly 10,000 feet (3,000 m), most of the region's mountains do not exceed 3,000 feet (910 m).

In the Colorado Desert (Imperial County), the geology is dominated by the transition of the tectonic plate boundary from rift to fault. The southernmost strands of the San Andreas Fault connect to the northern-most extensions of the East Pacific Rise. Consequently, the region is subject to earthquakes, and the crust is being stretched, resulting in a sinking of the terrain over time.

The Colorado Desert's climate distinguishes it from other deserts. The region experiences greater summer daytime temperatures than higher-elevation deserts and almost never experiences

frost. In addition, the Colorado Desert experiences two rainy seasons per year (in the winter and late summer), especially toward the southern portion of the region which includes a portion of San Diego County. The Colorado Desert portion of San Diego County receives the least amount of precipitation. Borrego Springs, the largest population center within the San Diego desert region averages 5 inches of rain with a high evaporation rate. By contrast, the more northerly Mojave Desert usually has only winter rains.

The west coast Peninsular Ranges, or other west ranges, of Southern California–northern Baja California, block most eastern Pacific coastal air and rains, producing an arid climate. Other short or longer-term weather events can move in from the Gulf of California to the south, and are often active in the summer monsoons. These include remnants of Pacific hurricanes, storms from the southern tropical jet stream, and the northern Inter Tropical Convergence Zone (ITCZ).

The arid nature of the region is demonstrated when historic annual average precipitation levels in Imperial County average 3.11" (**Figure 2-16**). During the 12 month period prior to the May 5, 2014 and May 6, 2014 event, Imperial County recorded a total annual precipitation of 2.12 inches. Such arid conditions, as those preceding the event, result in soils that are particularly susceptible to particulate suspension by the elevated gusty winds.

FIGURE 2-16
IMPERIAL COUNTY HISTORICAL WEATHER

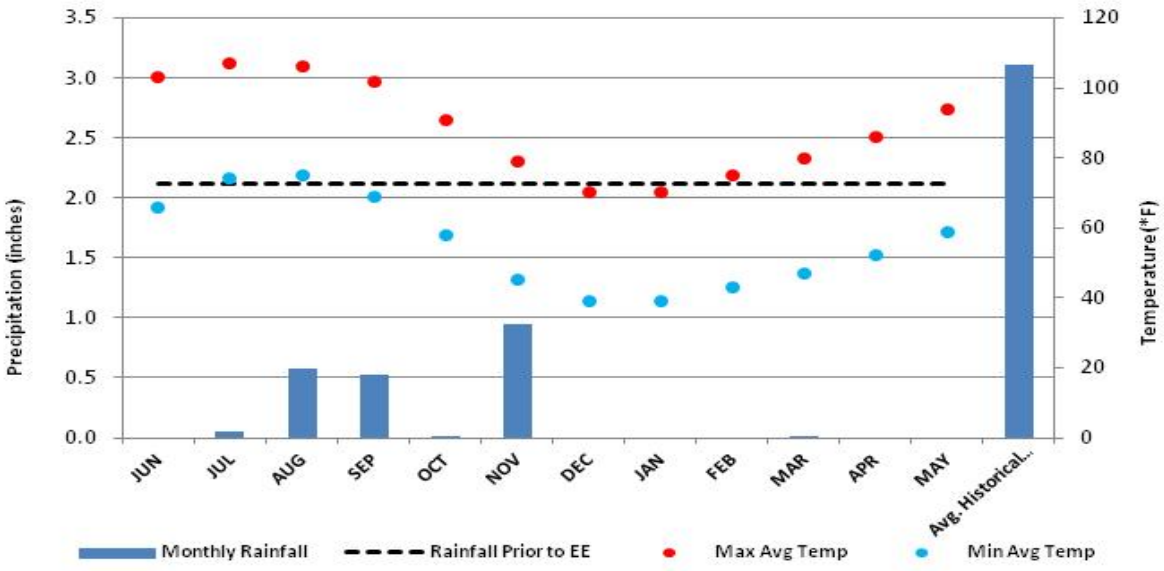

Fig 2-16: Historical Imperial County weather. Prior to May 5, 2014 and May 6, 2014, the region suffered abnormally low total annual precipitation of 2.12 inches. Average annual precipitation is 3.11 inches. Meteorological data courtesy of Western Regional Climate Center (WRCC) and Weather Underground http://www.wrcc.dri.edu/cgi-bin/climain.pl?ca2713

The NWS explains that the speed of any wind resulting from a weather system is directly proportional to the change in air pressure, called a pressure gradient, such that when the pressure gradient increases so does the speed of the wind.[5] Because the pressure gradient is just the difference in pressure between high and low pressure areas, changes in weather patterns may recur seasonally.

Typically, high pressure brings clear skies and with no clouds, there is more incoming shortwave solar radiation causing temperatures to rise. When surface winds become light, the cooling of the air produced directly under a high-pressure system can lead to a buildup of particulates in urban areas under an elongated region of relatively high atmospheric pressure or ridge causing widespread haze. Conversely, a trough is an elongated region of relatively low atmospheric pressure often associated with fronts. Troughs may be at the surface, or aloft under various conditions. Most troughs bring clouds, showers, and a wind shift, particularly following the passage of the trough.

While windblown dust events in Imperial County during the summer monsoon season are often due to outflow winds from thunderstorms, windblown dust events in the fall, winter, and spring are usually due to strong winds associated with low-pressure systems and cold fronts moving southeast across California. These winds are the result of strong surface pressure gradients between the approaching low-pressure system, accompanying cold front, and higher pressure ahead of it. As the low-pressure system and cold front approaches and passes, gusty southwesterly winds typically shift to northwesterly causing variable west winds. These strong winds suspend dust into the atmosphere and transport windblown dust over long distances, especially if soils in the region are dry.

II.3 Event Day Summary

The exceptional event for May 5, 2014 and May 6, 2014, caused by gusty west winds that preceded a strong or deep late season trough off the coast of Washington that moved down the west coast on Monday, May 5, 2014 then moved across Southern California on Tuesday, May 6, 2014.[6] According to the San Diego NWS office, the advancing low-pressure system near the Pacific Northwest coast brought stronger onshore flow creating strong gusty west winds Monday, May 5, 2014.[7] As the progression of the system moved, inland surface pressure gradients accelerated stronger onshore flow with resulting strong gusty westerly winds Tuesday, May 6, 2014.[8] Although the trough resulted in an impressive long wave packed with energy and enough moisture for showers, precipitation remained to the north along the San Gabriel and San

[5] NWS JetStream – Origin of Wind http://www.srh.noaa.gov/jetstream/synoptic/wind.html

[6] Area Forecast Discussion National Weather Service San Diego CA 845 PM PST (945 PM PDT) Sunday, May 4, 2014; 825 PM PST (925 PM PDT) Monday, May 5, 2014; 200 AM PST (300 AM PDT) Tuesday, May 6, 2014 and several advisories issued between Sunday May 4, 2014 through May 7, 2014.

[7] Urgent Weather Message National Weather Service San Diego, CA 236 AM PST (336 AM PDT); 255 AM PST (355 AM PDT), Monday, May 5, 2014

[8] Area Forecast Discussion National Weather Service San Diego CA 825 PM PST (925 PM PDT), Monday, May 5, 2014; 804 AM PST (904 AM PDT); 130 PM PST (230 PM PDT); 829 PM PST (929 PM PDT) Tuesday, May 6, 2014

Bernardino Mountains and adjacent southern foothills.[9] As a result, the NWS offices, located in San Diego and Phoenix both issued 20 separate notices in the form of Urgent Weather Messages, Hazardous Weather Outlooks, Local Storm Reports, Rain Fall Totals, and Public Information Statements. These notices contained Wind Advisories, Blowing Dust Advisories, High Wind Warnings, and measured highest observed wind gusts. The wind and dust advisories identified potentially reduced visibility due to blowing dust and sand.

Figures 2-17 through 2-19 provides information regarding the pressure gradients, and wind speed and direction on May 5, 2014 and May 6, 2014.

FIGURE 2-17
DAILY WEATHER MAPS MAY 5, 2014 AND MAY 6, 2014

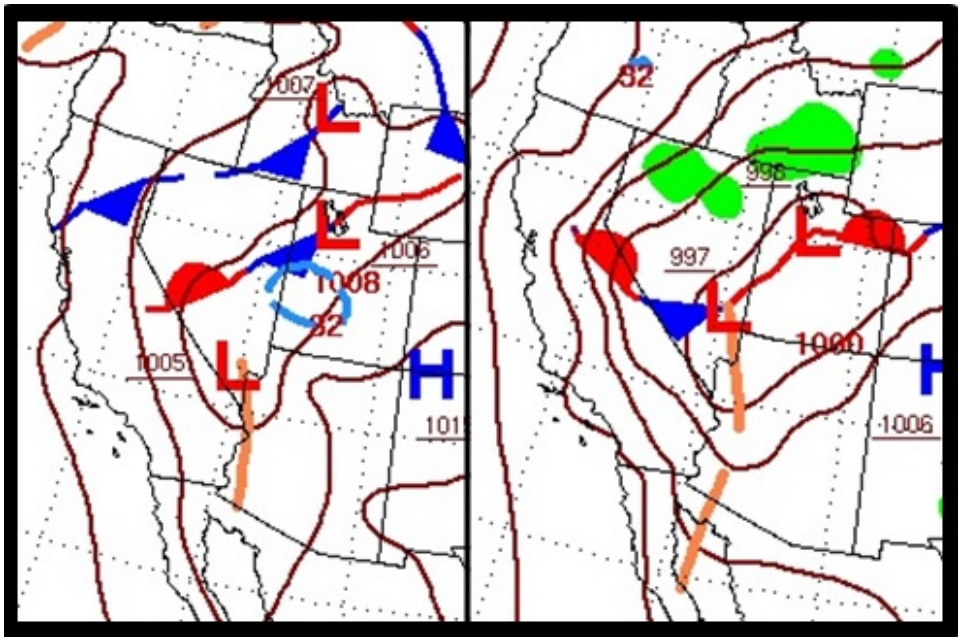

Fig 2-17: A pair of daily weather maps for May 5, 2014 (left) and May 6, 2014 (right) both at 0400 PST show a large surface low pressure and accompanying trough extending down from the Nevada-Arizona-California border into Mexico. A tightening of the pressure gradient on May 5, 2014 through May 6, 2014 led to gusty westerly winds across southeastern California and southwestern Arizona. Courtesy of the Weather Prediction Center

[9] Area Forecast Discussion National Weather Service San Diego CA 825 PM PST (925 PM PDT) Monday, May 5, 2014; 148 PM PST (248 PM PDT) Tuesday, May 6, 2014.

FIGURE 2-18
GOES-W SATELLITE IMAGES MAY 5, 2014

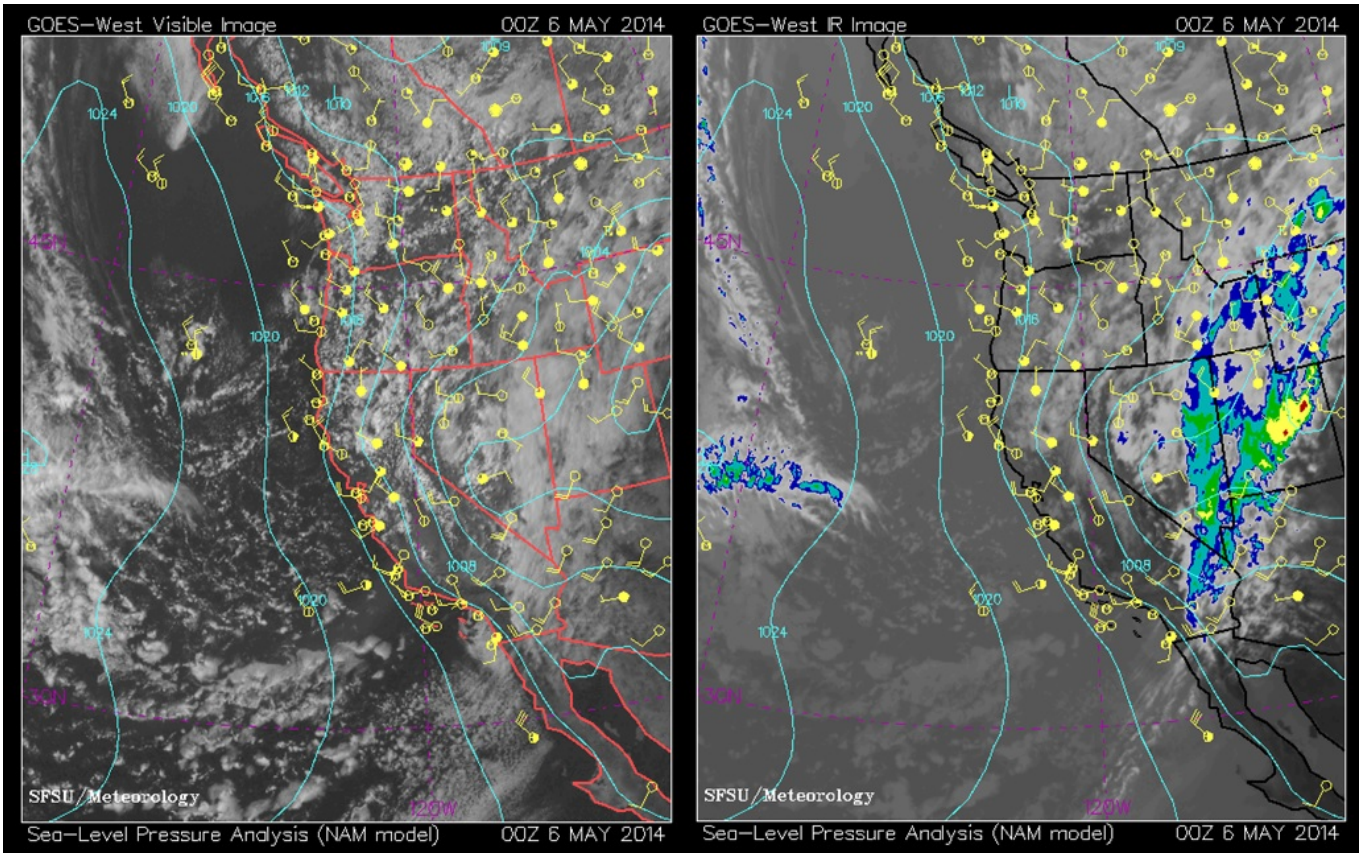

Fig 2-18: A pair of GOES-W satellite visible (left) and infrared (left) sea-level pressure analysis composite images shows active weather over southern California on May 5, 2014 at 1600 PST. Both images show westerly wind bards indicating winds at approximately 23 mph. Images courtesy of SFSU Department of Earth and Climate Sciences and the California Regional Weather Server

FIGURE 2-19
GOES-W SATELLITE IMAGES MAY 6, 2014

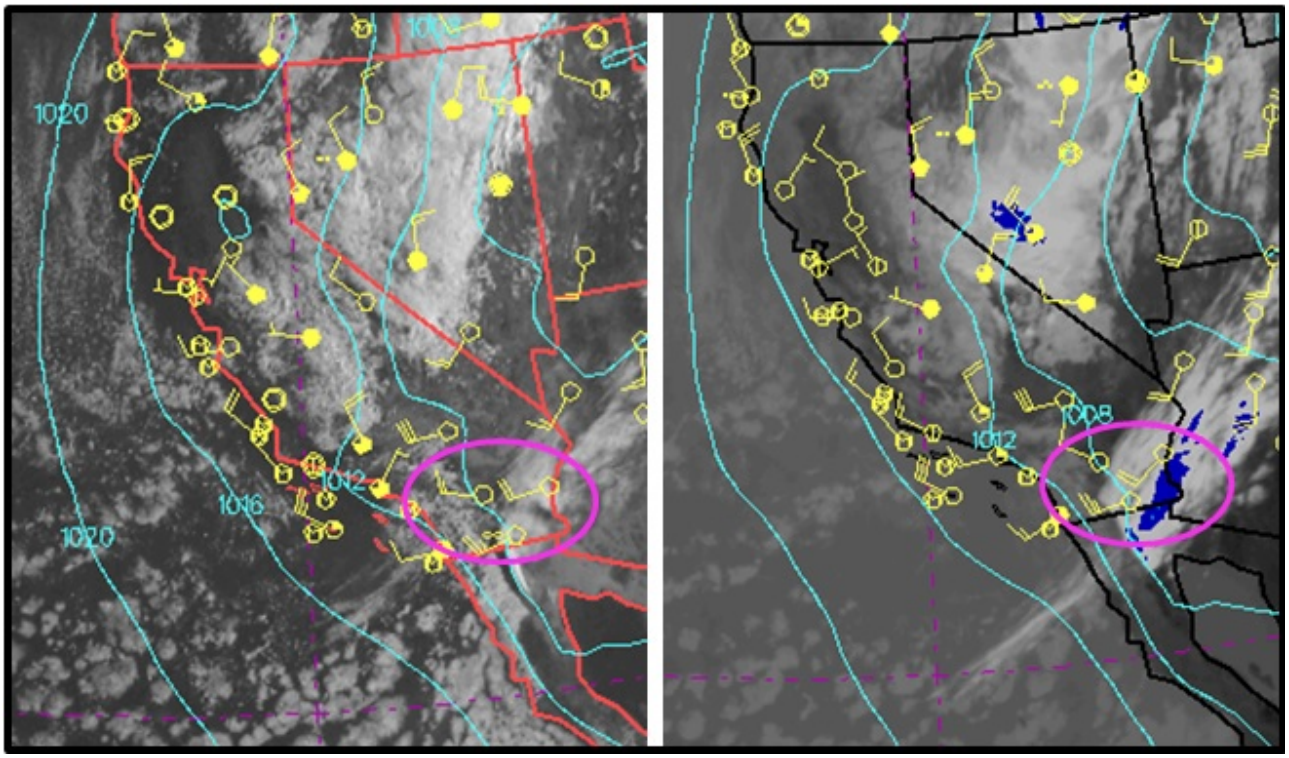

Fig 2-19: A pair of GOES-W satellite visible (left) and infrared (left) sea-level pressure analysis composite images shows active weather continued over southern California on May 6, 2014. The visible satellite image (07:00 LST) and the infrared image (10:00 LST) show wind barbs indicating westerly winds approaching 28 mph. Images courtesy of SFSU Department of Earth and Climate Sciences and the California Regional Weather Server

As mentioned above, the anticipated arrival of the late season trough prompted the NWS to issue no less than 20 separate notices in the form of Urgent Weather Messages, Hazardous Weather Outlooks, Local Storm Reports, Rain Fall Totals, and Public Information Statements. These notices contained Wind Advisories, Blowing Dust Advisories, High Wind Warnings, and measured highest observed wind gusts.

The earliest notice issued by the San Diego NWS office at 1900 PST (2000 PDT), Sunday May 4, 2014 identified strong and gusty westerly winds within the mountains and deserts through Tuesday, May 6, 2014. Advisories issued Tuesday, May 6, 2014 included High Wind Warnings and Blowing Dust Advisories. The Public Information Statement released by the San Diego NWS at 458 PM PST (558 PM PDT) Tuesday, May 6, 2014 reported the highest observed wind gusts since midnight within the San Diego County Deserts, identified as In Ko Pah, Ocotillo Wells, Borrego Springs and Narrows, between 35 mph and 43 mph.

Locally, light to moderate westerly winds prevailed at Imperial County Airport (KIPL) and El Centro NAF (KNJK). Westerly winds at KIPL and KNJK, prevailed on May 5, 2014 and May 6, 2014.

However, by May 6, 2014 strong SSW and WSW winds and gusts prevailed at both airports KIPL and KNJK. In addition, both KIPL and KNJK measured multiple and consecutive hours of winds above the 25 mph threshold on both days.

Finally, the "[d]escriptive text narrative for smoke/dust observed in Satellite imagery through 0100Z May 6, 2014" described a moderately dense sand storm across the Anza-Borrego Desert as well as the desert east of the Salton Sea Greenway as well as deserts South of Mexicali in far northern Baja California. The text identified the dust/sand as moving east, northeast and southeast. **Figures 2-20 and 2-21** are graphical illustrations of the key meteorological events for May 5, 2014 and May 6, 2014.

FIGURE 2-20
RAMP-UP ANALYSIS MAY 5, 2014

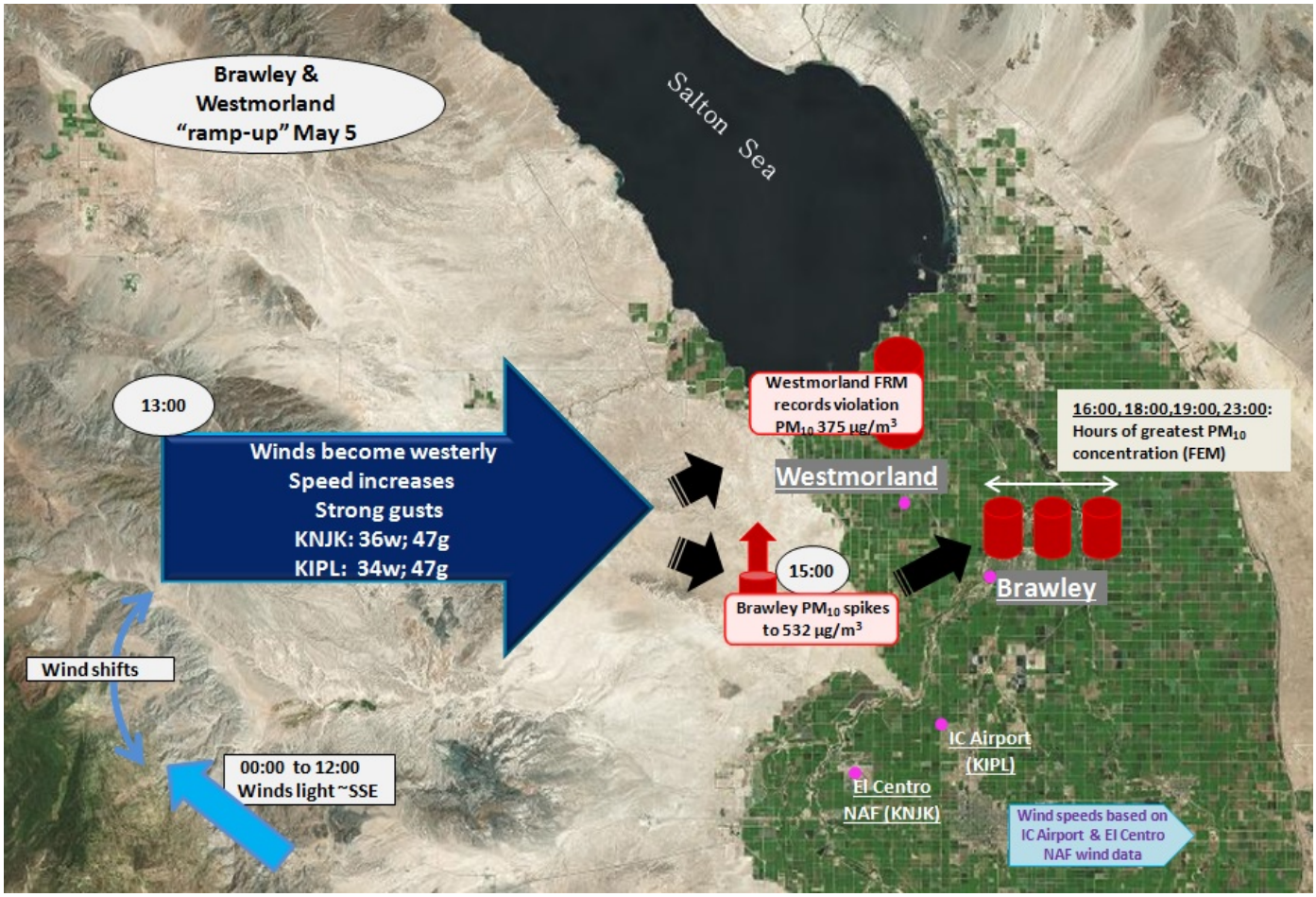

Fig 2-20: Illustrates key meteorological conditions leading up to the exceedance at the Brawley and Westmorland monitor on May 5, 2014. Gusty westerly winds as measured by KIPL and KNJK allowed transported windblown dust to enter Imperial County. Wind data from the NCEI's QCLCD databank. Air quality data from the EPA's AQS databank and the base map is from Google Earth. Arrows do not indicate a specific wind direction

FIGURE 2-21
RAMP-UP ANALYSIS MAY 6, 2014

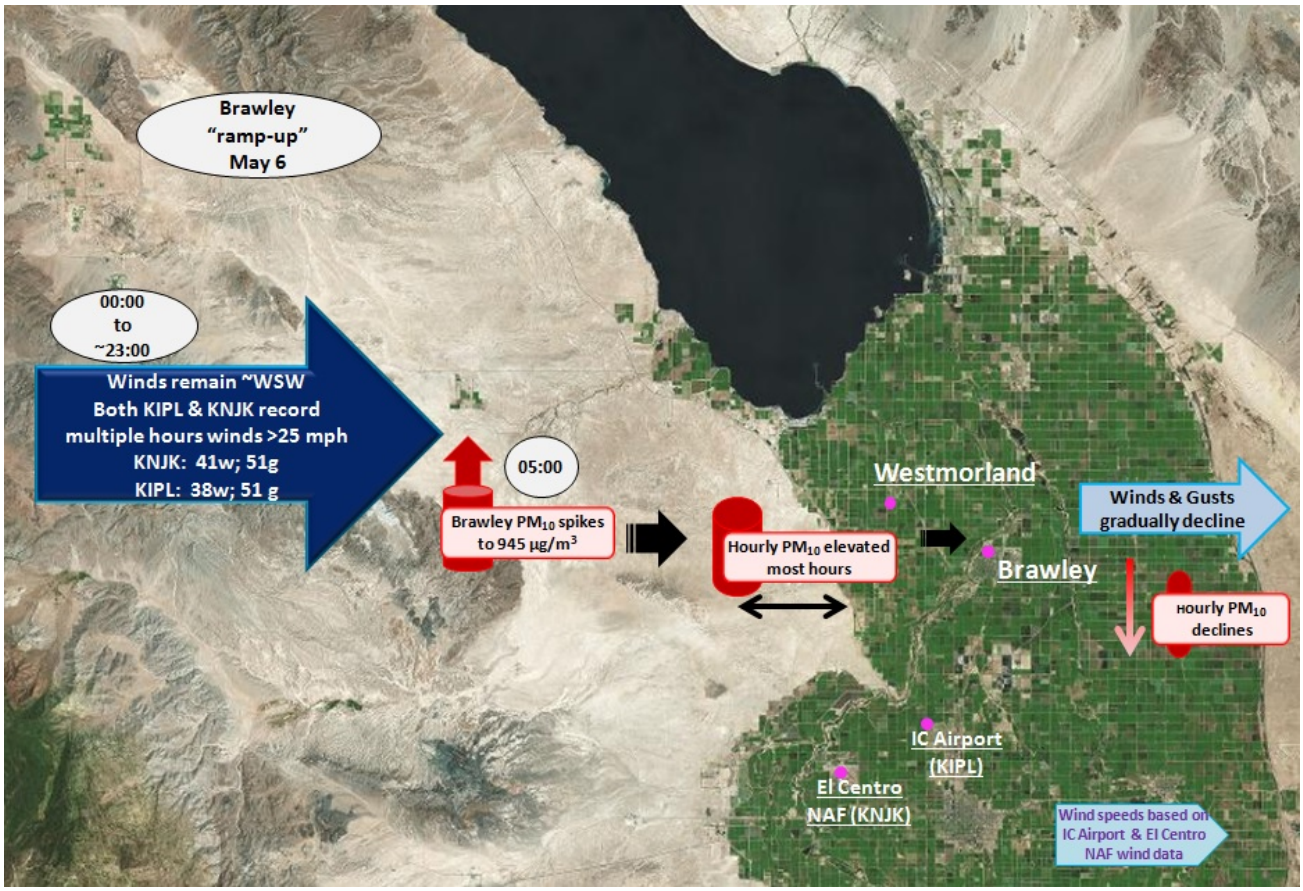

Fig 2-21: Illustrates key meteorological conditions leading up to the exceedance at the Brawley monitor on May 6, 2014. Gusty westerly winds as measured by KIPL and KNJK allowed transported windblown dust to enter Imperial County. Wind data from the NCEI's QCLCD data bank. Air quality data from the EPA's AQS databank and the Base map is from Google Earth. Arrows do not indicate a specific wind direction

Table 2-2 contains a summary of maximum winds, peak wind gusts, and wind direction at monitors in Imperial County, eastern Riverside County, Yuma County, Arizona, and Mexicali, Mexico. For detailed meteorological station, graphs see **Appendix B**.

TABLE 2-2
WIND SPEEDS ON MAY 5, 2014 AND MAY 6, 2014

Station Monitor Airport Meteorological Data IMPERIAL COUNTY	Day	Maximum Wind Speed (WS) (mph)	Wind Direction during Max WS (degrees)	*Time of Max Wind Speed	24 hr Maximum Wind Gust (WG) (mph)	Time of Max WG	PM_{10} correlated to time of Max Wind Speed	
							Brly	Nlnd
Imperial Airport (KIPL)	5	34	260	22:53	47	23:53	-	-
	6	38	290	10:05	51	9:53	374	-
Naval Air Facility (KNJK)	5	36	250	20:56	47	19:56	199.2	321.7
	6	41	250	10:56	52	11:37	374	-
Calexico (Ethel St)	5	16.5	295	15:00	-	-	532.6	-
	6	22.1	283	12:00	-	-	575.9	-
El Centro (9th Street)	5	15.2	277	23:00	-	-	563.2	-
	6	20.5	290	5:00	-	-	945.7	-
Niland (English Rd)	5	24.5	268	21:00	-	-	234.9	227.7
	6	28.8	258	9:00	-	-	147.4	-
RIVERSIDE COUNTY								
Blythe Airport (KBLH)	5	23	230	18:52	31	12:52	792.3	-
	6	28	240	15:52	36	18:52	166.4	397.8
Palm Springs Airport (KPSP)	5	26	320	17:53	41	13:53	-	-
	6	21	330	15:40	30	15:40	166.4	397.8
Jacqueline Cochran Regional Airport (KTRM) - Thermal	5	22	330	22:52	31	12:28	-	-
	6	28	280	5:10	36	5:10	945.7	-
ARIZONA - YUMA								
Yuma MCAS (KNYL)*MST	5	15	300	22:57	17	13:57	-	-
	6	30	290	7:57	40	7:25	423.8	-
MEXICALI - MEXICO								
Mexicali Int. Airport (MXL)	5	25.3	280	15:40	-	-	532	-
	6	27.6	270	08:50	-	-	98	-

*All time referenced throughout this document is in Pacific Standard Time (PST) unless otherwise noted

National Oceanic and Atmospheric Administration (NOAA) Air Resources Laboratory HYSPLIT back-trajectory models[10], **Figures 2-22** and **2-23,** illustrate the airflow in the hours before and during the event. **Figures 2-22 and 2-23** are back-trajectories for May 5, 2014 (6-hour) and May 6, 2014 (12-hour) coincident with the hour of highest concentration for that particular day at the Brawley monitor.[11]

Both models indicate that airflow approached from the southwest. This path enabled the strong, gusty westerly winds to transport dust particles from the San Diego mountain slopes and deserts into Imperial County over open natural deserts and agricultural lands affecting PM_{10} monitors throughout southeastern California and western Arizona. The elevated levels of PM_{10} concentrations measured in Riverside, Imperial and Yuma counties help confirm the regional nature of the event (**Tables 2-1 and 2-2**). The two-day meteorological event resulted in elevated

[10] The Hybrid Single Particle Lagrangian Integrated Trajectory Model (**HYSPLIT**) is a computer model that is a complete system for computing simple air parcel trajectories to complex dispersion and deposition simulations. It is currently used to compute air parcel trajectories and dispersion or deposition of atmospheric pollutants. One popular use of HYSPLIT is to establish whether high levels of air pollution at one location are caused by transport of air contaminants from another location. HYSPLIT's back trajectories, combined with satellite images (for example, from NASA's MODIS satellites), can provide insight into whether high air pollution levels are caused by local air pollution sources or whether an air pollution problem was blown in on the wind The initial development was a result of a joint effort between NOAA and Australia's Bureau of Meteorology. Source: NOAA/Air Resources Laboratory, 2011

[11] May 6, 2014 was not a scheduled monitoring day thus no continuous hourly concentrations are available for Westmorland.

emissions of PM_{10} concentrations causing the Westmorland and Brawley monitors to measure an exceedance on both days. Of notable importance is that modeled winds differ from local conditions. Data used in the HYSPLIT model has a horizontal integrated resolution of 12 km every three hours. Thus, the HYSPLIT model may differ from local observed surface wind speeds and directions.

FIGURE 2-22
NOAA HYSPLIT MODEL BRAWLEY MAY 5, 2014

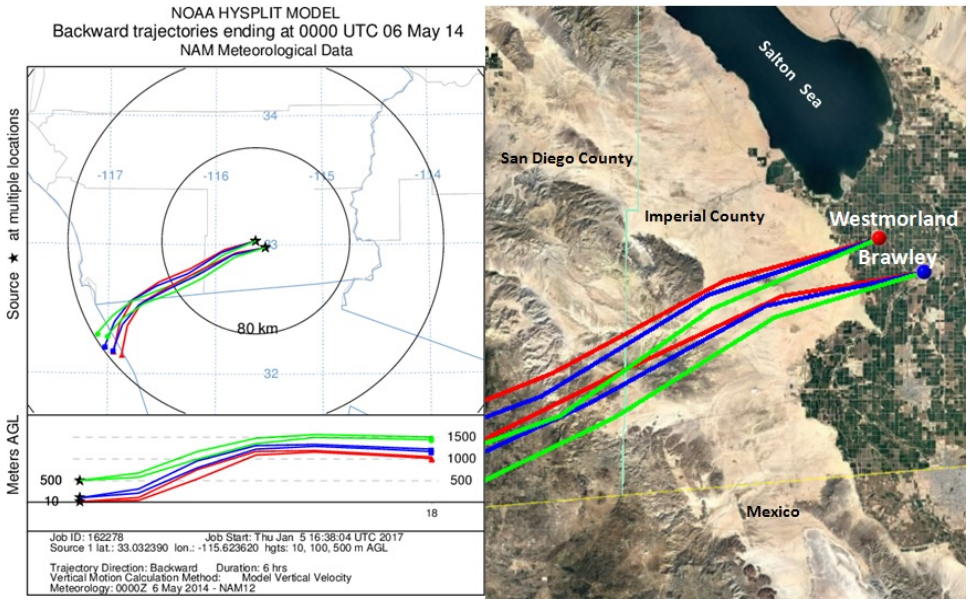

Fig 2-22: A 6-hour back-trajectory HYSPLIT model ending at Brawley and Westmorland at 1600 PST on May 5, 2014. Red indicates airflow at 10 meters above ground level (AGL); blue is 100 m; green is 500m. The strong, gusty westerly winds blew over the San Diego Mountains through mountain slopes and over natural open deserts and agricultural lands in Imperial County. Aqua line represents the border of San Diego and Imperial counties. Yellow line is the international border. Dynamically generated through NOAA Air Resources Laboratory and Base map is from Google Earth

FIGURE 2-23
NOAA HYSPLIT MODEL BRAWLEY MAY 6, 2014

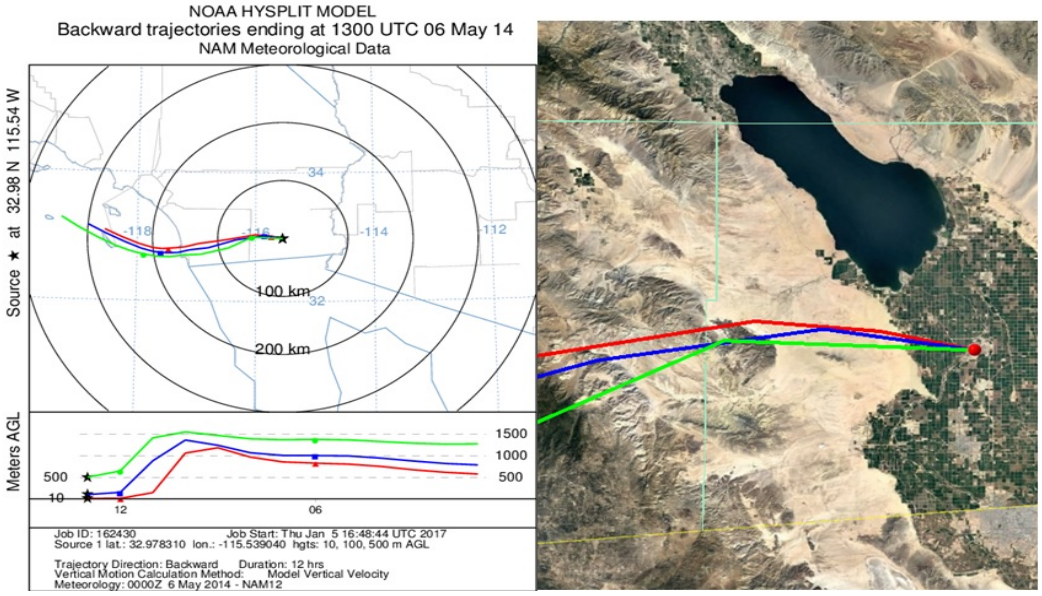

Fig 2-23: A 12-hour HYSPLIT back-trajectory ending at 0500 PST on May 6, 2014 illustrates the path of airflow, almost due west, towards Brawley. Much like the path of airflow on May 5, 2014, airflow towards the Brawley monitor had a predominant westerly direction. Red indicates airflow at 10 meters above ground level (AGL); blue is 100 m; green is 500m. Aqua line represents the border of San Diego and Imperial counties. Yellow line is the international border. Dynamically generated through NOAA Air Resources Laboratory and Base map is from Google Earth

Figure 2-24 illustrates the elevated levels of hourly PM_{10} concentrations measured in Riverside, Imperial and Yuma Counties for a total of four days, May 4, 2014 through May 7, 2014. Elevated emissions transported into Imperial County affected the Brawley and Westmorland monitors when a strong and gusty westerly winds preceding a deep low-pressure system moved towards southern California the afternoon of May 5, 2014 and inland on May 6, 2014.

The resulting entrained dust and accompanying high winds from the system qualify this event as a "high wind dust event".[12] High wind dust events are considered natural events where the windblown dust is either from solely a natural source or from areas where anthropogenic sources of windblown dust are controlled with Best Available Control Measures (BACM). The following sections provide evidence that the May 5, 2014 and May 6, 2014 high wind event qualifies as a natural event.

[12] Title 40 Code of Federal Regulations part 50: §50.1(p) High wind dust event is an event that includes the high-speed wind and the dust that the wind entrains and transports to a monitoring site.

FIGURE 2-24
96 HOUR PM_{10} CONCENTRATIONS AT REGIONAL STATIONS

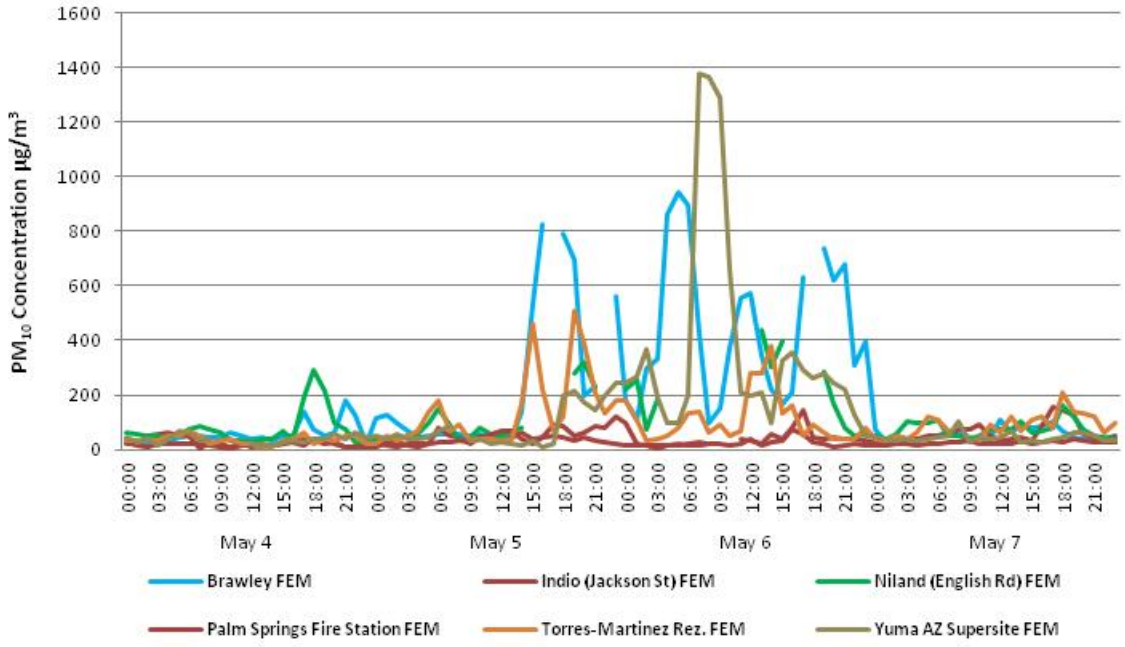

Fig 2-24: The regional effect of the gusty westerly winds is discerned when relative PM_{10} concentrations at various monitoring locations throughout Riverside, Imperial and Yuma counties elevated causing an exceedance on May 5, 2014 and May 6, 2014. Air quality data from the EPA's AQS data bank

III Historical Concentrations

III.1 Analysis

While naturally occurring high wind events may recur seasonally and at times frequently and qualify for exclusion under the EER, historical comparisons of the particulate concentrations and associated winds provide insight into the frequency of events within an identified area. The following time series plots illustrate that PM_{10} concentrations measured at the Brawley and Westmorland monitors on May 5, 2014 and May 6, 2014, compared to non-event and event days demonstrates the variability over several years and seasons. The analysis also provides supporting evidence that there exists a clear causal relationship between the May 5, 2014 and May 6, 2014 high wind event and the exceedance measured at the Brawley and Westmorland monitors.

Figures 3-1 through 3-6 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Brawley and Westmorland monitors for the period of January 1, 2010 through May 6, 2014. Note that prior to 2013, BAM data was not FEM therefore, not reported into AQS.[13] Properly establishing the variability of the event, as it occurred on May 5, 2014 and May 6, 2014, 24-hour averaged PM_{10} concentrations between January 1, 2010 and May 6, 2014 were compiled and plotted as time series. All figures illustrate that the exceedance, which occurred on May 5, 2014 and May 6, 2014 were outside the normal historical concentrations when compared to event and non-event days. Air Quality data from the EPA's AQS data bank.

[13] Pollutant concentration data contained in EPA's Air Quality System (AQS) are required to be reported in units corrected to standard temperature and pressure (25 C, 760 mm Hg). Because the PM_{10} concentrations prior to 2013 were not reported into the AQS database all BAM (FEM) data prior to 2013 within this report are expressed as micrograms per cubic meter (mg/m3) at local temperature and pressure (LTP) as opposed to standard temperature and pressure (STP, 760 torr and 25 C). The difference in concentration measurements between standard conditions and local conditions is insignificant and does not alter or cause any significant changes in conclusions to comparisons of PM_{10} concentrations to PM_{10} concentrations with in this demonstration.

FIGURE 3-1
BRAWLEY HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 6, 2014

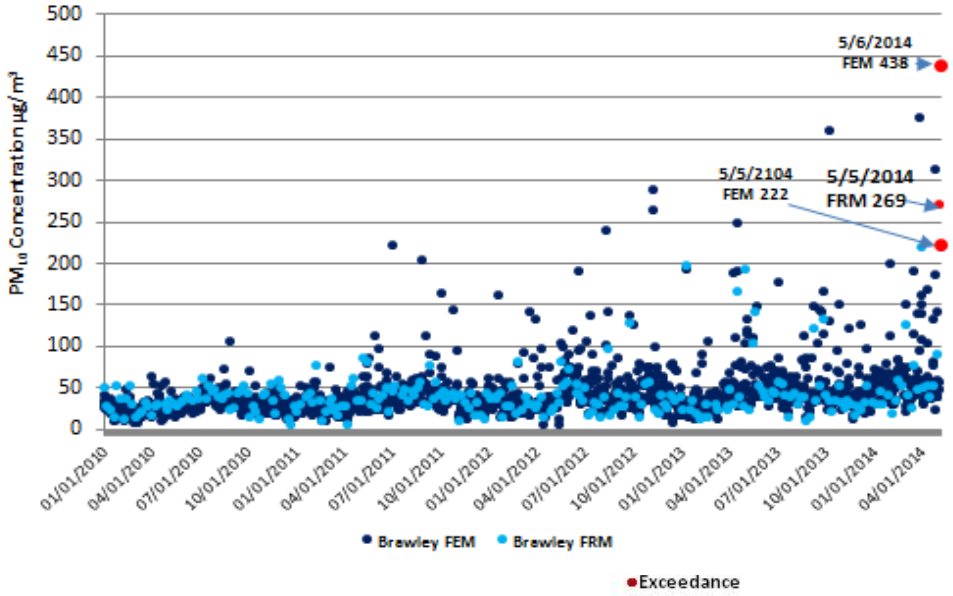

Fig 3-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 269 µg/m^3, 222 µg/m^3 and 438 µg/m^3 by the Brawley monitor on May 5, 2014 and May 6, 2014 was outside the normal historical concentrations when compared to similar days and nonevent days. Of the 1,587 sampling days, there were 26 exceedance days, which is less than a 2.0% occurrence rate

FIGURE 3-2
WESTMORLAND HISTORICAL COMPARISON
FRM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 5, 2014

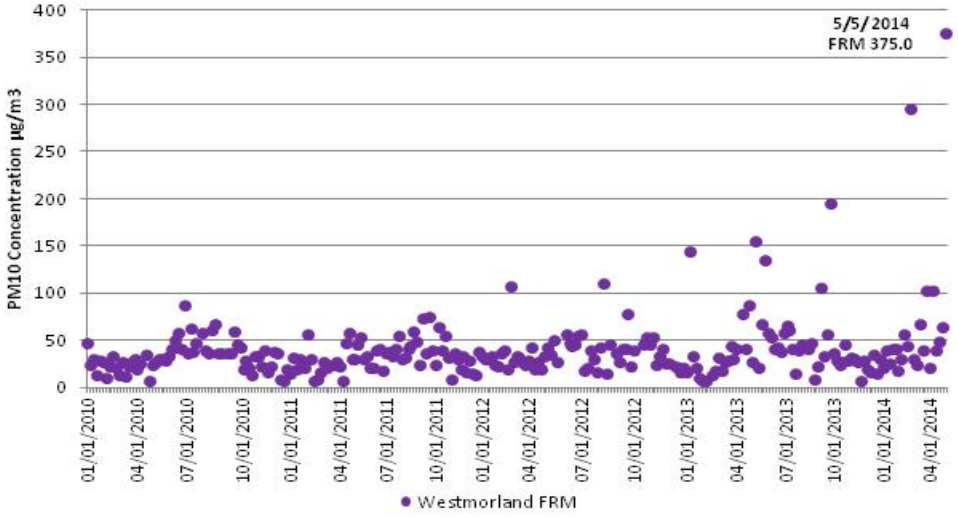

Fig 3-2: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 375 µg/m^3 by the Westmorland monitor on May 5, 2014 was outside the normal historical concentrations when compared to similar days and nonevent days. Of the 277 scheduled (1-6) sampling days, there were 4 exceedance days, which is less than a 1.5% occurrence rate

FIGURE 3-3
BRAWLEY AND WESTMORLAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 6, 2014

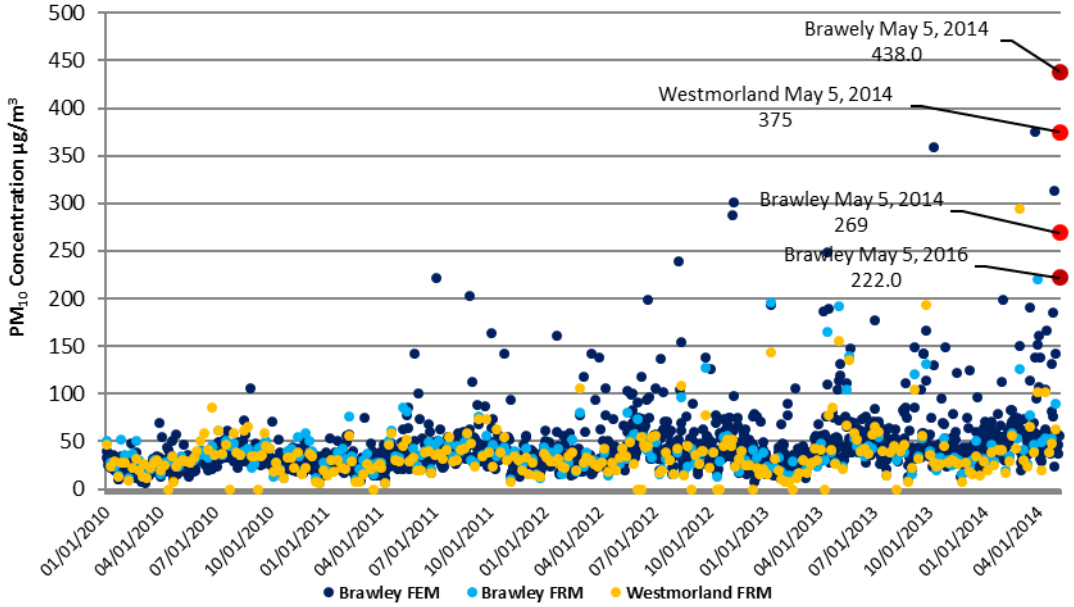

Fig 3-3: A comparison of the combined PM_{10} historical concentrations demonstrates that the measured concentration of 375 µg/m^3 by the Westmorland monitor on May 5, 2014 and the measured concentration of 269 µg/m^3, 222 µg/m^3 and 438 µg/m^3 by the Brawley monitor are outside the normal historical concentrations when compared to similar days and nonevent days. Of the 1,587 sampling days, there were 27 exceedance days, which is less than a 2.0% occurrence rate

The time series, **Figure 3-3**, for Brawley and Westmorland included 2,115 credible samples, measured between January 1, 2010 and May 6, 2014.

Overall, the time series illustrates that the Brawley and Westmorland monitors, measured 27 exceedance days out of the 1,587 sampling days, which is less than a 2.0% occurrence rate. Of the 27 measured exceedance days, 11 exceedance days occurred during the second quarter (April - June). The remaining 16 exceedance days occurred during the first, third, and fourth quarters. The May 5, 2014 and May 6, 2014 concentrations are outside the normal historical measurements for the second quarter. No exceedances of the standard occurred during 2010. As mentioned above, FEM BAM data was not regulatory from 2010 to 2012.

FIGURE 3-4
BRAWLEY SEASONAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
APRIL 1, 2010 TO JUNE 30, 2014

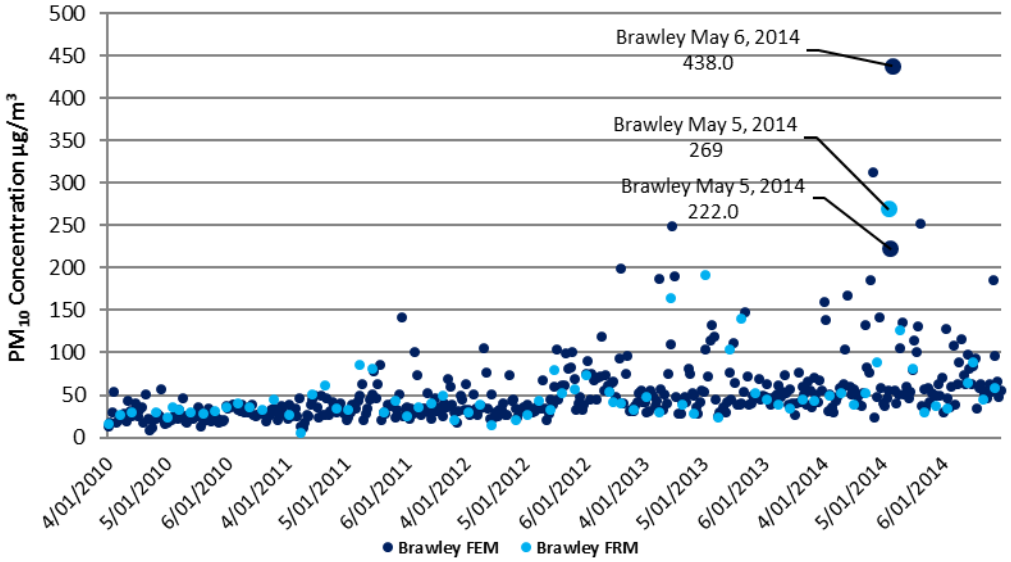

Fig 3-4: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 269 µg/m^3, 222 µg/m^3 and 438 µg/m^3 by the Brawley monitor was outside the normal seasonal concentrations when compared to similar days and nonevent days. Of the 400 sampling days, there were 11 exceedance days, which is less than a 3.0% occurrence rate

FIGURE 3-5
WESTMORLAND SEASONAL COMPARISON
FRM PM_{10} 24 HR AVG CONCENTRATIONS
APRIL 1, 2010 TO JUNE 30, 2014

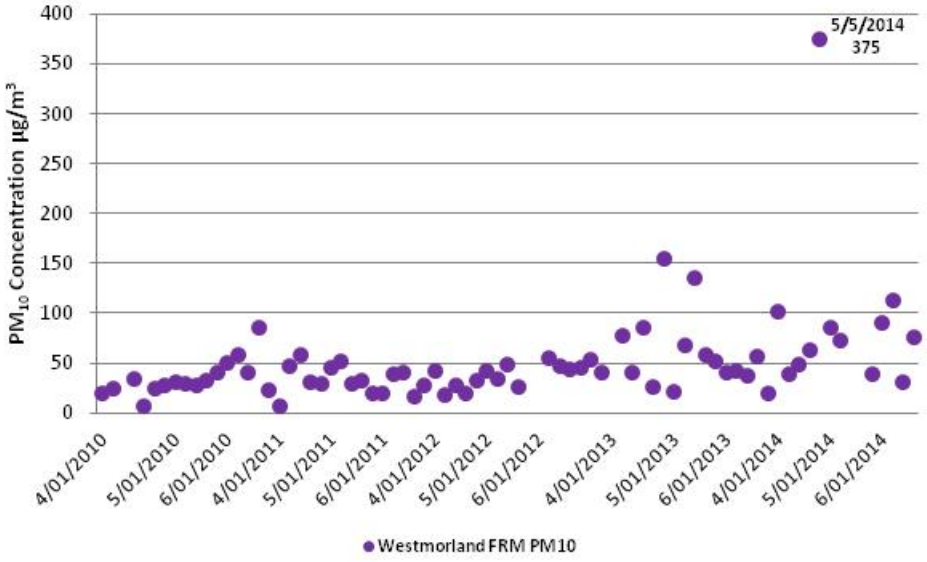

Fig 3-5: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 375 µg/m^3 by the Westmorland monitor was outside the normal seasonal concentrations when compared to similar days and nonevent days. Of the 70 sampling days, there were 2 exceedance days, which is less than a 3.0% occurrence rate

FIGURE 3-6
BRAWLEY AND WESTMORLAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
APRIL 1, 2010 TO JUNE 30, 2014

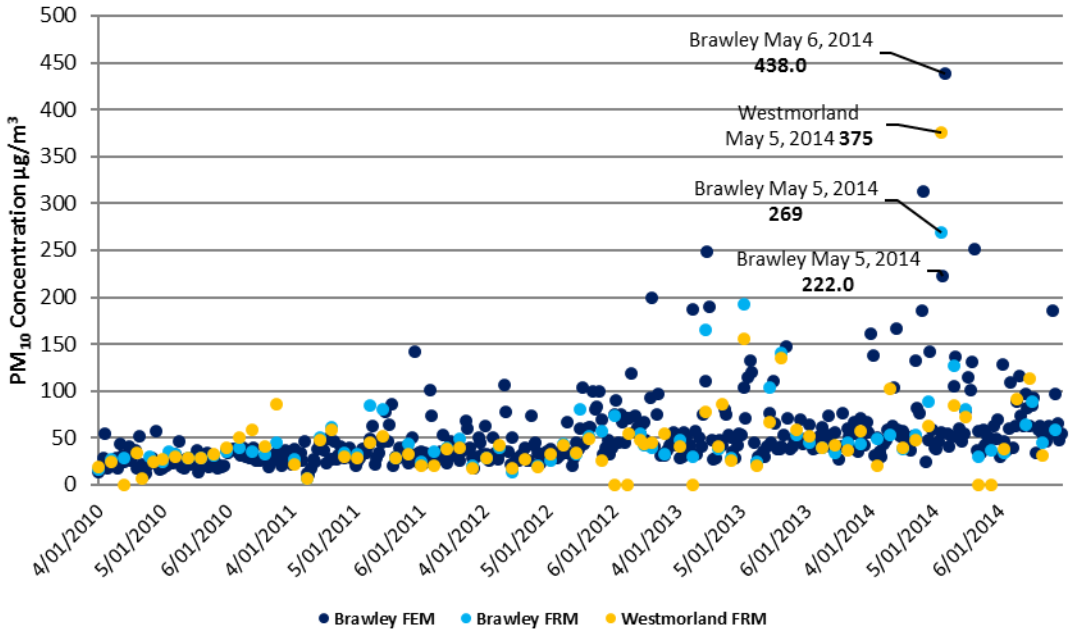

Fig 3-6: A comparison PM_{10} seasonal concentrations demonstrates that the measured concentrations of 269 µg/m^3, 222 µg/m^3 and 438 µg/m^3 by the Brawley monitor and the measured concentration of 375 µg/m^3 by the Westmorland were outside the normal seasonal measurements. Of the 400 sampling days, there were 11 exceedance days, which is less than a 3.0% occurrence rate

Figures 3-4 through 3-6, display the seasonal fluctuations over 400 sampling days at the Brawley and Westmorland monitors for second quarter (April to June) between 2010 and 2014. The Brawley and Westmorland monitors measured 533 credible samples over 400 sampling days. Of the 400 sampling days, there were 11 combined measured exceedance days, which equates to less than a 3.0% occurrence rate. The May 5, 2014 and May 6, 2014 measured concentrations at the Brawley and Westmorland monitors were outside the normal historical and seasonal concentrations when compared to both event days and non-event days.

FIGURE 3-7
BRAWLEY AND WESTMORLAND HISTORICAL
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 THROUGH JUNE 30, 2014

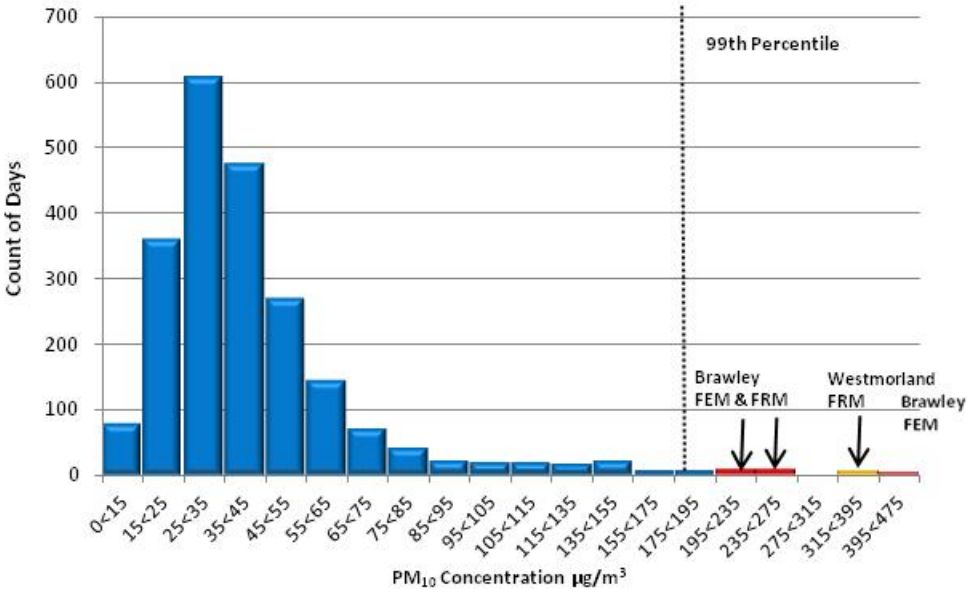

Fig 3-7: The 24-hr average PM_{10} concentrations measured at the Brawley and Westmorland monitoring sites demonstrates that the May 5, 2014 and May 6, 2014 event was in excess of the 99th percentile

FIGURE 3-8
BRAWLEY AND WESTMORLAND SEASONAL
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
APRIL 1, 2010 TO JUNE 30, 2014

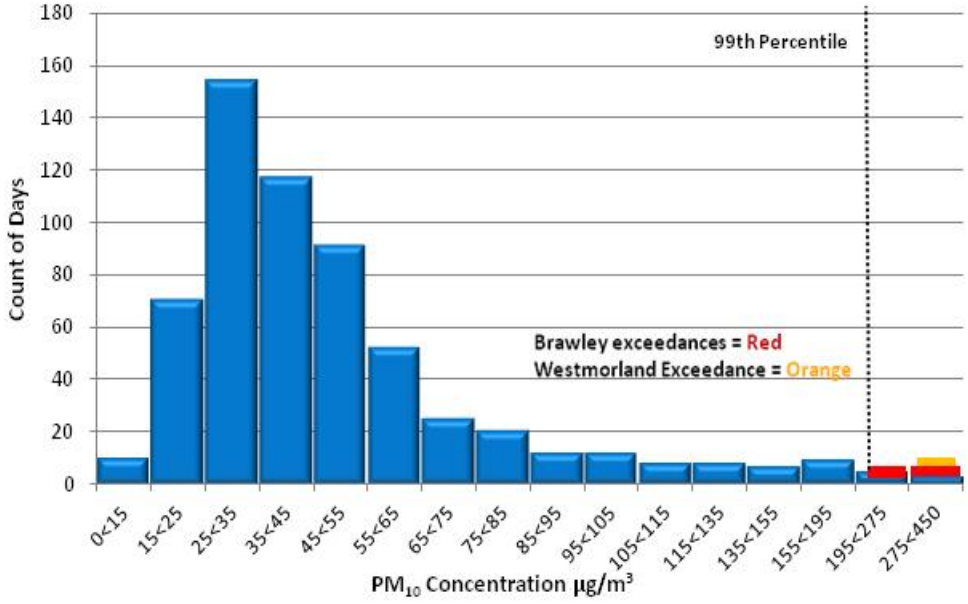

Fig 3-8: The 24-hr average PM_{10} concentrations at the Brawley and Westmorland monitoring sites demonstrates that the May 5, 2014 and May 6, 2014 event was in excess of the 99th percentile (Brawley exceedance is in Red, Westmorland exceedance is in Orange)

For the combined FRM and FEM data sets for the Brawley and Westmorland monitors the annual historical and the seasonal historical PM_{10} concentrations of 269 µg/m^3, 222 µg/m^3 and 438 µg/m^3 measured by the Brawley monitor and 375 µg/m^3 measured by the Westmorland monitor are above the 99th percentile ranking. Looking at the annual time series concentrations, the seasonal time series concentrations, and the percentile rankings for both the historical and seasonal patterns the May 5, 2014 and May 6, 2014 measured exceedances are clearly outside the normal concentration levels when comparing to non-event days and event days.

III.2 Summary

The information provided, above, by the time series plots, seasonal time series plots, and the percentile rankings illustrate that the PM_{10} concentration observed on May 5, 2014 and May 6, 2014 occurs infrequently. When comparing the measured PM_{10} levels on May 5, 2014 and May 6, 2014 and following USEPA EER guidance, this demonstration provides supporting evidence that the measured exceedances measured at the Westmorland and Brawley monitors were outside the normal historical and seasonal historical concentration levels.

The historical concentration analysis provided here supports the determination that the May 5, 2014 and May 6, 2014 natural event affected the concentrations levels at the Brawley and Westmorland monitors causing an exceedance. The concentration analysis further supports that the natural event affected air quality in such a way that there exists a clear causal relationship between the measured exceedances on May 5, 2014 and May 6, 2014 and the natural event, qualifying the natural event as an Exceptional Event.

IV Not Reasonably Controllable or Preventable

According to the October 3, 2016 promulgated revision to the Exceptional Event (EE) rule under 40 CFR §50.14(b)(8) air agencies must address the "not reasonably controllable or preventable" (nRCP) criterion as two prongs. To address the nRCP criterion the ICAPCD must not only identify the natural and anthropogenic sources of emissions causing and contributing to the monitored exceedance but must identify the relevant State Implementation Plan (SIP) measures and/or other enforceable control measures in place for the identified sources. An effective analysis of the nRCP must include the implementation status of the control measures to consider the measures as enforceable. USEPA considers control measures enforceable if approved into the SIP within 5 years of an EE demonstration submittal. The identified control measures must address those specific sources that as causing or contributing to a monitored exceedance.

The final EE rule revision explains that an event is not reasonably controllable if reasonable measures to control the impact of the event on air quality were applied at the time of the event. Similarly, an event is not reasonably preventable if reasonable measures to prevent the event were applied at the time of the event. However, for "high wind events" when PM_{10} concentrations are due to dust raised by high winds from desert areas whose sources are controlled with Best Available Control Measures (BACM) then the event is a "natural event" where human activity plays little or no direct causal role and thus is considered not preventable.

This section begins by providing background information on all SIP and other enforceable control measures in force during the EE for May 5, 2014 and May 6, 2014. In addition, this May 5, 2014 and May 6, 2014 demonstration provides technical and non-technical evidence that strong and gusty westerly winds blew across the mountains and deserts within southeastern California and into Imperial County suspending particulate matter affecting the Westmorland and Brawley monitors on May 5, 2014 and May 6, 2014. This section identifies all natural and anthropogenic sources and provides regulatory evidence of the enforceability of the control measures in place during the May 5, 2014 and May 6, 2014 EE.

IV.1 Background

Inhalable particulate matter (PM_{10}) contributes to effects that are harmful to human health and the environment, including premature mortality, aggravation of respiratory and cardiovascular disease, decreased lung function, visibility impairment, and damage to vegetation and ecosystems. Upon enactment of the 1990 Clean Air Act (CAA) amendments, Imperial County was classified as moderate nonattainment for the PM_{10} NAAQS under CAA sections 107(d)(4)(B) and 188(a). By November 15, 1991, such areas were required to develop and submit State Implementation Plan (SIP) revisions providing for, among other things, implementation of reasonably available control measures (RACM).

Partly to address the RACM requirement, ICAPCD adopted local Regulation VIII rules to control PM_{10} from sources of fugitive dust on October 10, 1994, and revised them on November 25, 1996. USEPA did not act on these versions of the rules with respect to the federally enforceable SIP.

On August 11, 2004, USEPA reclassified Imperial County as a serious nonattainment area for PM_{10}. As a result, CAA section 189(b)(1)(B) required all BACM to be implemented in the area within four years of the effective date of the reclassification, i.e., by September 10, 2008.

On November 8, 2005, partly to address the BACM requirement, ICAPCD revised the Regulation VIII rules to strengthen fugitive dust requirements. On July 8, 2010, USEPA finalized a limited approval of the 2005 version of Regulation VIII, finding that the seven Regulation VIII rules largely fulfilled the relevant CAA requirements. Simultaneously, USEPA also finalized a limited disapproval of several of the rules, identifying specific deficiencies that needed to be addressed to fully demonstrate compliance with CAA requirements regarding BACM and enforceability.

In September 2010, ICAPCD and the California Department of Parks and Recreation (DPR) filed petitions with the Ninth Circuit Federal Court of Appeals for review of USEPA's limited disapproval of the rules. After hearing oral argument on February 15, 2012, the Ninth Circuit directed the parties to consider mediation before rendering a decision on the litigation. On July 27, 2012, ICAPCD, DPR and USEPA reached agreement on a resolution to the dispute which included a set of specific revisions to Regulation VIII. These revisions are reflected in the version of Regulation VIII adopted by ICAPCD on October 16, 2012 and approved by USEPA April 22, 2013. Since 2006 ICAPCD had implemented regulatory measures to control emissions from fugitive dust sources and open burning in Imperial County.

FIGURE 4-1
REGULATION VIII GRAPHIC TIMELINE DEVELOPMENT

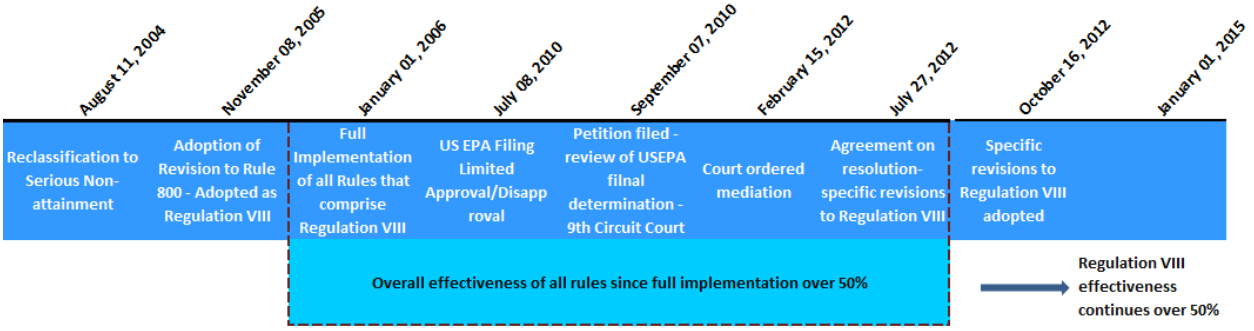

Fig 4-1: Regulation VIII Graphic Timeline

IV.1.a Control Measures

A brief summary of Regulation VIII, which is comprised of seven fugitive dust rules, is found below. The **Appendix D** contains the complete set of rules.

ICAPCD's Regulation VIII consists of seven interrelated rules designed to limit emissions of PM_{10} from anthropogenic fugitive dust sources in Imperial County.

Rule 800, General Requirements for Control of Fine Particulate Matter, provides definitions, a compliance schedule, exemptions and other requirements generally applicable to all seven rules. It requires the United States Bureau of Land Management (BLM), United States Border Patrol (BP) and DPR to submit dust control plans (DCP) to mitigate fugitive dust from areas and/or activities under their control. Appendices A and B within Rule 800 describe methods for determining compliance with opacity and surface stabilization requirements in Rules 801 through 806.

Rule 801, Construction and Earthmoving Activities, establishes a 20% opacity limit and control requirements for construction and earthmoving activities. Affected sources must submit a DCP and comply with other portions of Regulation VIII regarding bulk materials, carry-out and track-out, and paved and unpaved roads. The rule exempts single family homes and waives the 20% opacity limit in winds over 25 mph under certain conditions.

Rule 802, Bulk Materials, establishes a 20% opacity limit and other requirements to control dust from bulk material handling, storage, transport and hauling.

Rule 803, Carry-Out and Track-Out, establishes requirements to prevent and clean-up mud and dirt transported onto paved roads from unpaved roads and areas.

Rule 804, Open Areas, establishes a 20% opacity limit and requires land owners to prevent vehicular trespass and stabilize disturbed soil on open areas larger than 0.5 acres in urban areas, and larger than three acres in rural areas. Agricultural operations are exempted.

Rule 805, Paved and Unpaved Roads, establishes a 20% opacity limit and control requirements for unpaved haul and access roads, canal roads and traffic areas that meet certain size or traffic thresholds. It also prohibits construction of new unpaved roads in certain circumstances. Single-family residences and agricultural operations are exempted.

Rule 806, Conservation Management Practices, requires agricultural operation sites greater than 40 acres to implement at least one conservation management practice (CMP) for each of several activities that often generate dust at agricultural operations. In addition, agricultural operation sites must prepare a CMP plan describing how they comply with Rule 806, and must make the CMP plan available to the ICAPCD upon request.

IV.1.b Additional Measures

Imperial County Natural Events Action Plan (NEAP)

On August 2005, the ICAPCD adopted a NEAP for the Imperial County, as was required under the former USEPA Natural Events Policy, to address PM_{10} events by:

- Protecting public health;
- Educating the public about high wind events;
- Mitigating health impacts on the community during future events; and
- Identifying and implementing BACM measures for anthropogenic sources of windblown dust.

Smoke Management Plan (SMP) Summary

There are 35 Air Pollution Control Districts or Air Quality Management Districts in California, which are required to implement a district-wide smoke management program. The regulatory basis for California's Smoke Management Program, codified under Title 17 of the California Code of Regulations is the "Smoke Management Guidelines for Agricultural and Prescribed Burning" (Guidelines). California's 1987 Guidelines were revised to improve interagency coordination, avoid smoke episodes, and provide continued public safety while providing adequate opportunity for necessary open burning. The revisions to the 1987 Guidelines were approved March 14, 2001. All air districts, with the exception of the San Joaquin Valley Air Pollution Control District (SJAPCD) were required to update their existing rules and Smoke Management Plans to conform to the most recent update to the Guidelines.

Section 80150 of Title 17 specifies the special requirements for open burning in agricultural operations, the growing of crops and the raising of fowl or animals. This section specifically requires the ICAPCD to have rules and regulations that require permits that contain requirements that minimize smoke impacts from agricultural burning.

On a daily basis, the ICAPCD reviews surface meteorological reports from various airport agencies, the NWS, State fire agencies and CARB to help determine whether the day is a burn day. Using a four quadrant map of Imperial County allowed burns are allocated in such a manner as to assure minimal to no smoke impacts safeguarding the public health. Finally, all permit holders are required to notice and advise members of the public of a potential burn. This noticing requirement is known as the Good Neighbor Policy. On May 5, 2014 and May 6, 2014, the ICAPCD declared a no burn day **(Appendix A).** No complaints were filed for agricultural burning on May 5, 2014 and May 6, 2014.

IV.1.c Review of Source-Permitted Inspections and Public Complaints

A query of the ICAPCD permit database was compiled and reviewed for active permitted sources throughout Imperial County and specifically around Westmorland and Brawley during the May 5, 2014 and May 6, 2014 PM_{10} exceedance. Both permitted and non-permitted sources are required to comply with Regulation VIII requirements that address fugitive dust emissions. The identified permitted sources are Aggregate Products, Inc., US Gypsum Quarry, Imperial Aggregates (Val-Rock, Inc., and Granite Construction), US Gypsum Plaster City, Clean Harbors (Laidlaw Environmental Services), Bullfrog Farms (Dairy), Burrtec Waste Industries, Border Patrol Inspection station, Centinela State Prison, various communications towers not listed and various

agricultural operations. Non-permitted sources include the wind farm known as Ocotillo Express, and a solar facility known as CSolar IV West. Finally, the desert regions are under the jurisdiction of the Bureau of Land Management and the California Department of Parks (Including Anza Borrego State Park and Ocotillo Wells).

An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions on May 5, 2014 and May 6, 2014 officially designated as NO burn days.

While the ICAPCD did not received, any complaints on May 5, 2014 and May 6, 2014 related to agricultural or waste burning, the ICAPCD did investigate three dust complaints on May 6, 2014. The first complaint, described excessive dust created by farm equipment traffic and disturbed farmland. The investigation, by certified personnel found the site in compliance, thus no violation was issued. The second and third complaints described excessive dust originating from a wind farm located near Ocotillo. The complaints identified high winds causing blowing dust. The follow up investigation, by certified personnel, concluded the site was properly maintained and found in compliance the issuance of a violation was not warranted. **Appendix A** contains copies of pertinent documents to the May 5, 2014 and May 6, 2014 event.

FIGURE 4-2
PERMITTED SOURCES

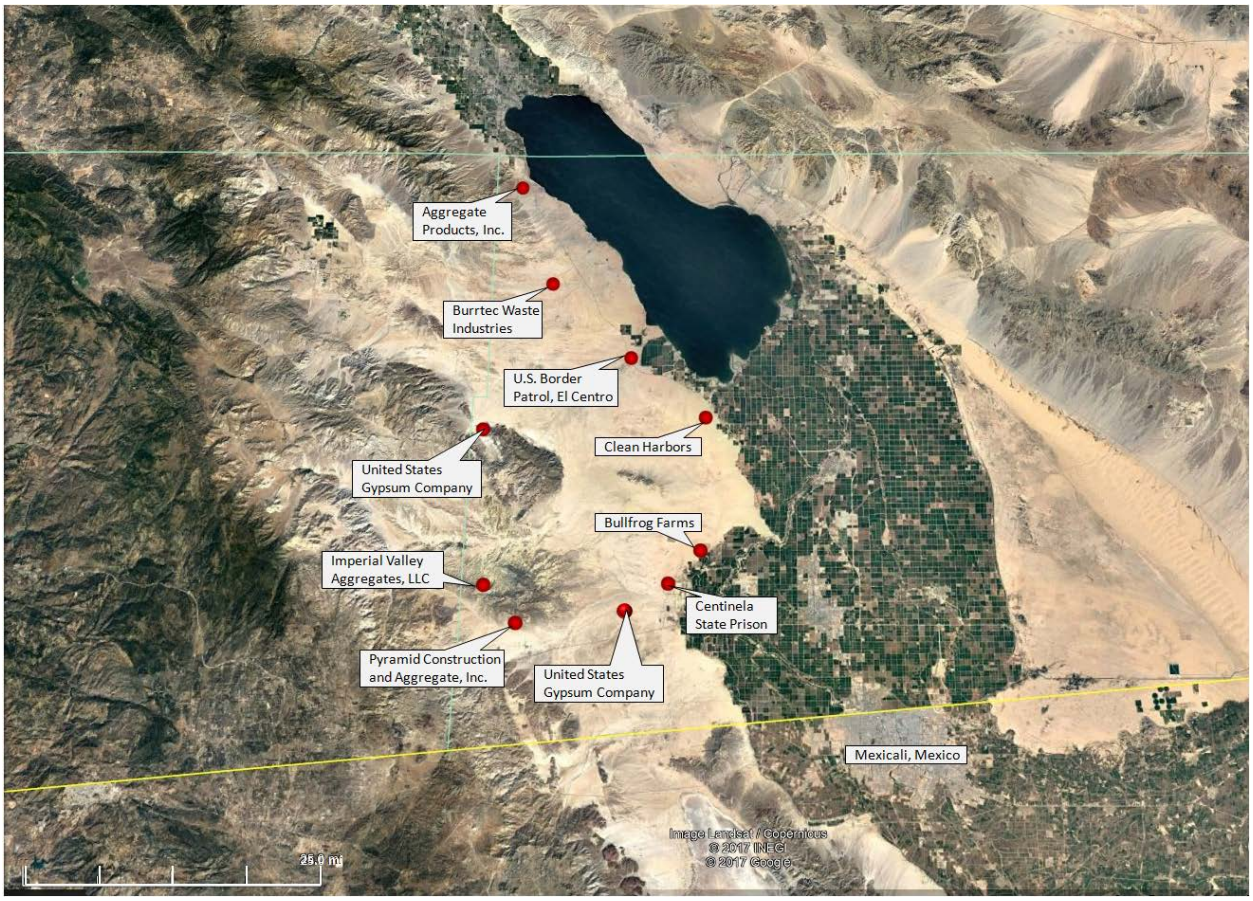

Fig 4-2: The above map identifies those permitted sources located west, northwest and southwest of the Brawley and Westmorland monitors. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States and Mexico. The green checker-boarded areas are a mixed use of agricultural and community parcels. In addition, either the Bureau of Land Management or the California Department of Parks manages the desert areas. Base map from Google Earth

FIGURE 4-3
NON-PERMITTED SOURCES

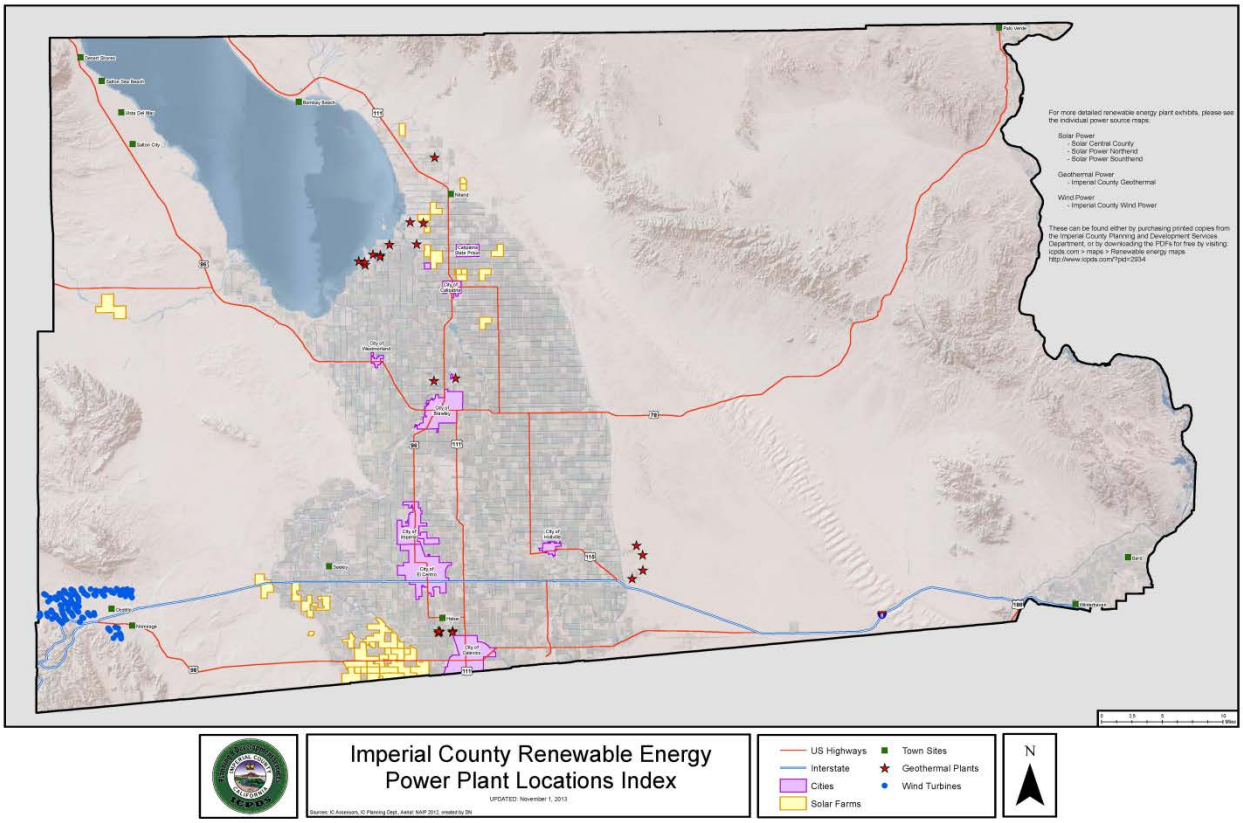

Fig 4-3: The above map identifies those power sources located west, northwest and southwest of the Brawley and Westmorland monitors. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

IV.2 Forecasts and Warnings

As described above, thee ICAPCD provided the National Weather Service (NWS) weather discussion via the ICAPCD's webpage for May 5, 2014 and May 6, 2014. The ICAPCD notification included forecast information indicating that windy conditions for May 5, 2014 and May 6, 2014 along with patchy blowing dust were possible. On May 5, 2014, the ICAPCD advised individuals that the NWS issued wind advisories advising of strong and gusty westerly winds as a late season storm approached Southern California. On a separate note, the ICAPCD made available the NWS wind and dust advisories for Monday, May 5, 2014 and Tuesday, May 6, 2014. As the weather system moved inland extended advisories by the Phoenix NWS office were issued. The extended wind advisory for May 6, 2014 included a "Blowing Dust Advisory" that warned of reduced visibility due to windblown dust within southeast California and along the lower Colorado River valley. **Appendix A** contains copies of pertinent documents to the May 5, 2014 and May 6, 2014 event.

IV.3 Wind Observations

Wind data during the event were available from airports in eastern Riverside County, southern San Diego County, southwestern Yuma County (Arizona), northern Mexico, and Imperial County. On May 5, 2014, Imperial County Airport (KIPL) reported maximum winds of 34 mph and peak gusts of 47 mph. El Centro Naval Air Facility (KNJK) reported maximum winds of 36 mph and peak gusts of 47 mph. On May 6, 2014, KIPL reported maximum winds of 38 mph with peak gusts of 51 mph. KNJK reported maximum winds of 41 mph and peak gusts of 52 mph. Of significant note, is that on May 5, 2014 and May 6, 2014 both KIPL and KNJK reported multiple and consecutive hours of winds above 25 mph. Supporting the regional nature of the natural event, other regional airfields similarly reported strong winds. The Campo airfield (KCZZ), located within the Mountain Empire area of southeastern San Diego County (west of Imperial County), reported peak gusts of 29 mph on May 5, 2014, and peak gusts of 36 mph on May 6, 2014. In Riverside County, the Blythe Airport (KBLH) measured wind gusts of 34 mph on May 6, 2014. Because wind speeds over 25 mph are normally sufficient to overcome most PM_{10} control measures meteorological data as presented here clearly demonstrates that during the May 5, 2014 and May 6, 2014 natural event wind speeds were in fact above the 25 mph threshold overcoming the BACM in place. See also **Tables 2-1 and 2-2** for wind speeds.

IV.4 Summary

The weather and air quality forecasts and warnings outlined in this section demonstrate strong gusty westerly winds preceding a late season trough off the coast of Washington that moved down the west coast on Monday, May 5, 2014 then moved across Southern California on Tuesday, May 6, 2014 caused windblown uncontrollable PM_{10} emissions. The BACM within Imperial County for fugitive dust emissions were in place at the time of the event. These control measures are required for areas designated as "serious" non-attainment for PM_{10}, such as in Imperial County. Thus, the BACM in place at the time of the event were beyond reasonable. In addition, surface wind measurements in and around the Westmorland and Brawley monitors during the event were high enough (at or above 25 mph, with wind gusts over 40 mph) that BACM PM_{10} control measures would have been overwhelmed.

Finally, a high wind dust event can be considered as a natural event, even when portions of the wind-driven emissions are anthropogenic, as long as those emissions have a clear causal relationship to the event and were determined to be not reasonably controllable or preventable. This demonstration has shown that the event that occurred on May 5, 2014 and May 6, 2014 was not reasonably controllable or preventable despite the strong and in force BACM within the affected areas in Imperial County. This demonstration has similarly established a clear causal relationship between the exceedances and the high wind event timeline and geographic location. The May 5, 2014 and May 6, 2014 event can be considered an exceptional event under the requirements of the exceptional event rule.

V Clear Causal Relationship

V.1 Discussion

Meteorological observations for May 5, 2014 and May 6, 2014 identified gusty westerly winds that preceded a strong or deep late season trough off the coast of Washington that moved down the west coast on Monday, May 5, 2014 then moved across Southern California on Tuesday, May 6, 2014.[14]

As previous explained in section II, the low-pressure system near the Pacific Northwest coast brought stronger onshore flow creating strong gusty west winds Monday, May 5, 2014.[15] As the progression of the system moved, inland surface pressure gradients accelerated stronger onshore flow with resulting strong gusty westerly winds Tuesday, May 6, 2014.[16] As a result, the NWS offices, located in San Diego and Phoenix both issued 20 separate notices in the form of Urgent Weather Messages, Hazardous Weather Outlooks, Local Storm Reports, Rain Fall Totals, and Public Information Statements. These notices contained Wind Advisories, Blowing Dust Advisories, High Wind Warnings, and measured highest observed wind gusts. The wind and dust advisories identified potentially reduced visibility due to blowing dust and sand.

Finally, although the trough resulted in an impressive long wave packed with energy and enough moisture for showers, precipitation remained to the north along the San Gabriel and San Bernardino Mountains and adjacent southern foothills allowing dry conditions to exist in and around Imperial County.[17] The gusty westerly winds maintained a predominantly west direction, primarily affecting the northern section of Imperial County. The windblown dust transported by the gusty westerly winds blew over the San Diego mountain passes onto the open natural desert floor over agricultural lands affecting air quality and causing an exceedance at the Westmorland and Brawley monitors.

Entrained windblown dust from natural open areas, particularly from the natural open desert areas west of Imperial County, along with anthropogenic sources controlled with BACM, is confirmed by the meteorological and air quality observations on May 5, 2014 and May 6, 2014.

Figures 5-1 and 5-2 provide information regarding the nature of the windblown dust and it affect upon the northern section of Imperial County. The illustration provide some insight into the reason why on May 5, 2014 both the Calexico and El Centro monitors measured elevated concentrations below 100 $\mu g/m^3$.

[14] Area Forecast Discussion National Weather Service San Diego CA 845 PM PST (945 PM PDT) Sunday, May 4, 2014; 825 PM PST (925 PM PDT) Monday, May 5, 2014; 200 AM PST (300 AM PDT) Tuesday, May 6, 2014 and several advisories issued between Sunday May 4, 2014 through May 7, 2014.

[15] Urgent Weather Message National Weather Service San Diego, CA 236 AM PST (336 AM PDT); 255 AM PST (355 AM PDT), Monday, May 5, 2014

[16] Area Forecast Discussion National Weather Service San Diego CA 825 PM PST (925 PM PDT), Monday, May 5, 2014; 804 AM PST (904 AM PDT); 130 PM PST (230 PM PDT); 829 PM PST (929 PM PDT) Tuesday, May 6, 2014

[17] Area Forecast Discussion National Weather Service San Diego CA 825 PM PST (925 PM PDT) Monday, May 5, 2014; 148 PM PST (248 PM PDT) Tuesday, May 6, 2014.

FIGURE 5-1
MODIS TERRA SATELLITE IMAGE MAY 5, 2014

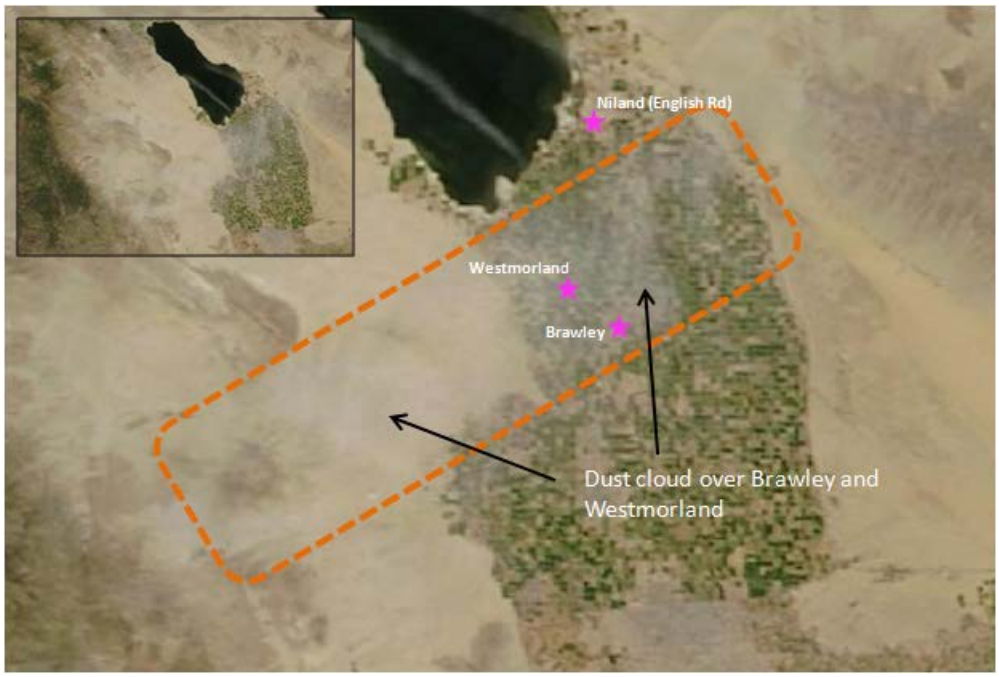

Fig 5-1: MODIS Terra image captured on May 5, 2014 (~13:30 PST) identifies the windblown dust (boxed area) transported by strong gusty westerly winds. The NWS issued high wind advisories for southeastern California and the lower Colorado River valley, including Imperial County. MODIS image through AirNow Tech

FIGURE 5-2
MODIS TERRA SATELLITE IMAGE MAY 6, 2014

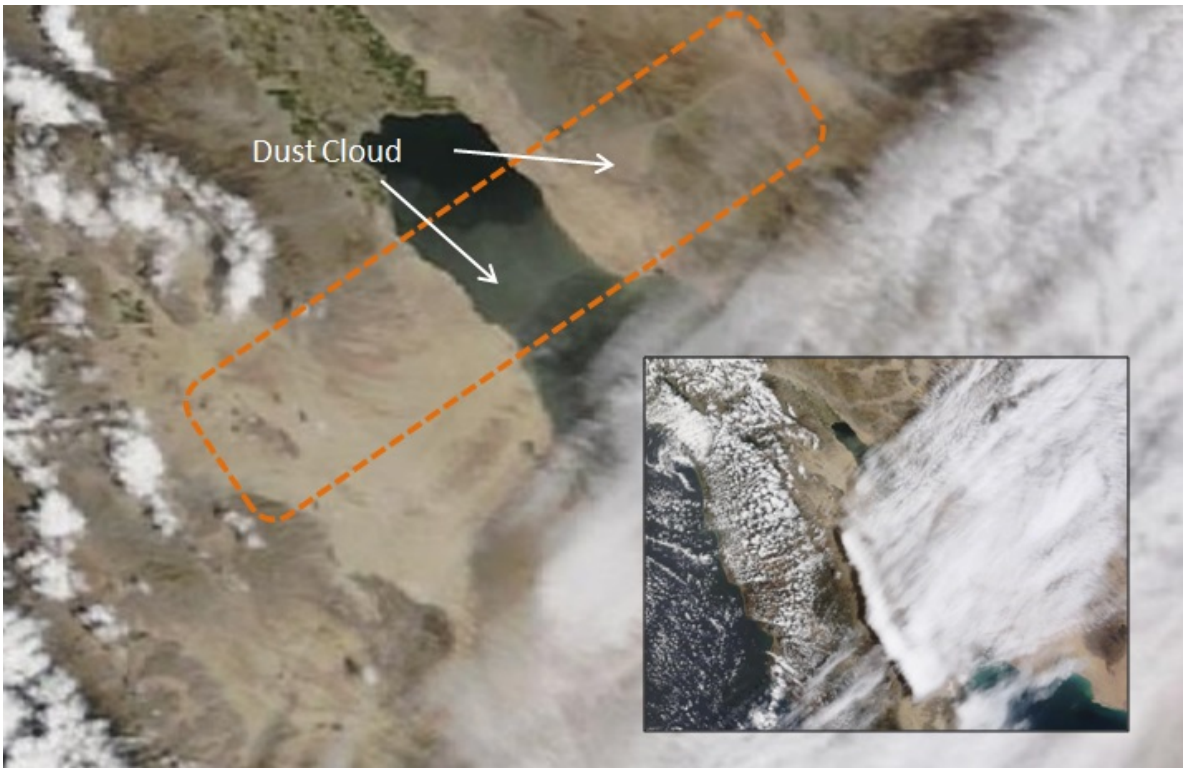

Fig 5-2: MODIS Terra image captured on May 6, 2014 (~10:30 PST) clearly identified the windblown dust (boxed area) transported by the gusty westerly winds. The NWS issued a high wind advisory for Imperial County. MODIS image through AirNow Tech

As explained in previous sections, the anticipated arrival of the late season trough prompted the NWS to issue no less than 20 separate notices in the form of Urgent Weather Messages, Hazardous Weather Outlooks, Local Storm Reports, Rain Fall Totals, and Public Information Statements. These notices contained Wind Advisories, Blowing Dust Advisories, High Wind Warnings, and measured highest observed wind gusts.

The earliest notice issued by the San Diego NWS office at 1900 PST (2000 PDT), Sunday May 4, 2014 identified strong and gusty westerly winds within the mountains and deserts through Tuesday, May 6, 2014. Advisories issued Tuesday, May 6, 2014 included High Wind Warnings and Blowing Dust Advisories. The Public Information Statement released by the San Diego NWS at 458 PM PST (558 PM PDT) Tuesday, May 6, 2014 reported the highest observed wind gusts since midnight within the San Diego County Deserts, identified as In Ko Pah, Ocotillo Wells, Borrego Springs and Narrows, between 35 mph and 43 mph. These site are located to the west, southwest and northwest of Brawley and Westmorland. In Ko Pah is along Interstate 8 while Ocotillo Wells, Borrego Springs and Narrows are west and northwest of the Brawley and Westmorland.

Locally, light to moderate westerly winds prevailed at Imperial County Airport (KIPL) and El Centro NAF (KNJK). Westerly winds at KIPL and KNJK, prevailed on May 5, 2014 and May 6, 2014. On May 5, 2014, while KIPL measured winds 15 to 26 mph and gusts up to 40 mph several other stations, such as the Blythe Airport (KBLH), the Palm Springs International Airport (KPSP) and the Naval Air Facility (KNJK) measured windy conditions with gusts over 30 mph. The strong winds continued into Imperial County where sites like KNJK and KIPL measured 2 or more consecutive hours of winds 25 mph or greater with gusts above 30 mph.

As the weather system moved inland on May 6, 2014 strong SSW and WSW winds and gusts prevailed at both airports KIPL and KNJK. As the day, progressed continuous and strong gusty westerlies in excess of 25 mph were measured at airports and other sites. Thirteen wind measurements at or above 28 mph were measured at KIPL while KNJK measured 17 measurements of winds at or above 25 mph. Measured gusts reached 31 mph. By the evening hours of May 6, 2014, winds slowly diminished allowing suspended particulates to saturate the monitors. In any event, both KIPL and KNJK measured multiple and consecutive hours of winds above the 25 mph threshold on both days.

Although it is clear to see that strong gusty westerly winds affected Imperial County monitors primarily within the northern section, the Niland continuous monitor did not exceed for technical reasons on May 5, 2014 and May 6, 2014. During the course of the two days 18 hours of measured concentrations were invalided when the Niland monitor failed to function according the required USEPA criteria, on May 5, 2014 (6 hours) and May 6, 2014 (12 hours). Therefore, in all likelihood, Niland would have exceeded the NAAQS.

As mentioned above the Calexico and El Centro monitors measured elevated concentrations below 100 µg/m3 on May 5, 2014 as windblown dust primarily affected the northern section of Imperial County. May 6, 2014 was not a scheduled sampling day and any speculation as to the nature of any potential exceedance would simply be that, speculation.

Finally, the "[d]escriptive text narrative for smoke/dust observed in Satellite imagery through 0100Z May 6, 2014" described a moderately dense sand storm across the Anza-Borrego Desert as well as the desert east of the Salton Sea Greenway as well as deserts South of Mexicali in far northern Baja California. The text identified the dust/sand as moving east, northeast and southeast. **Figures 5-3 through 5-4** are graphical illustrations regarding the key meteorological events for May 5, 2014 and May 6, 2014 superimposed over a reproduce HYSPLIT.

FIGURE 5-3
EXCEEDANCE FACTORS MAY 5, 2014

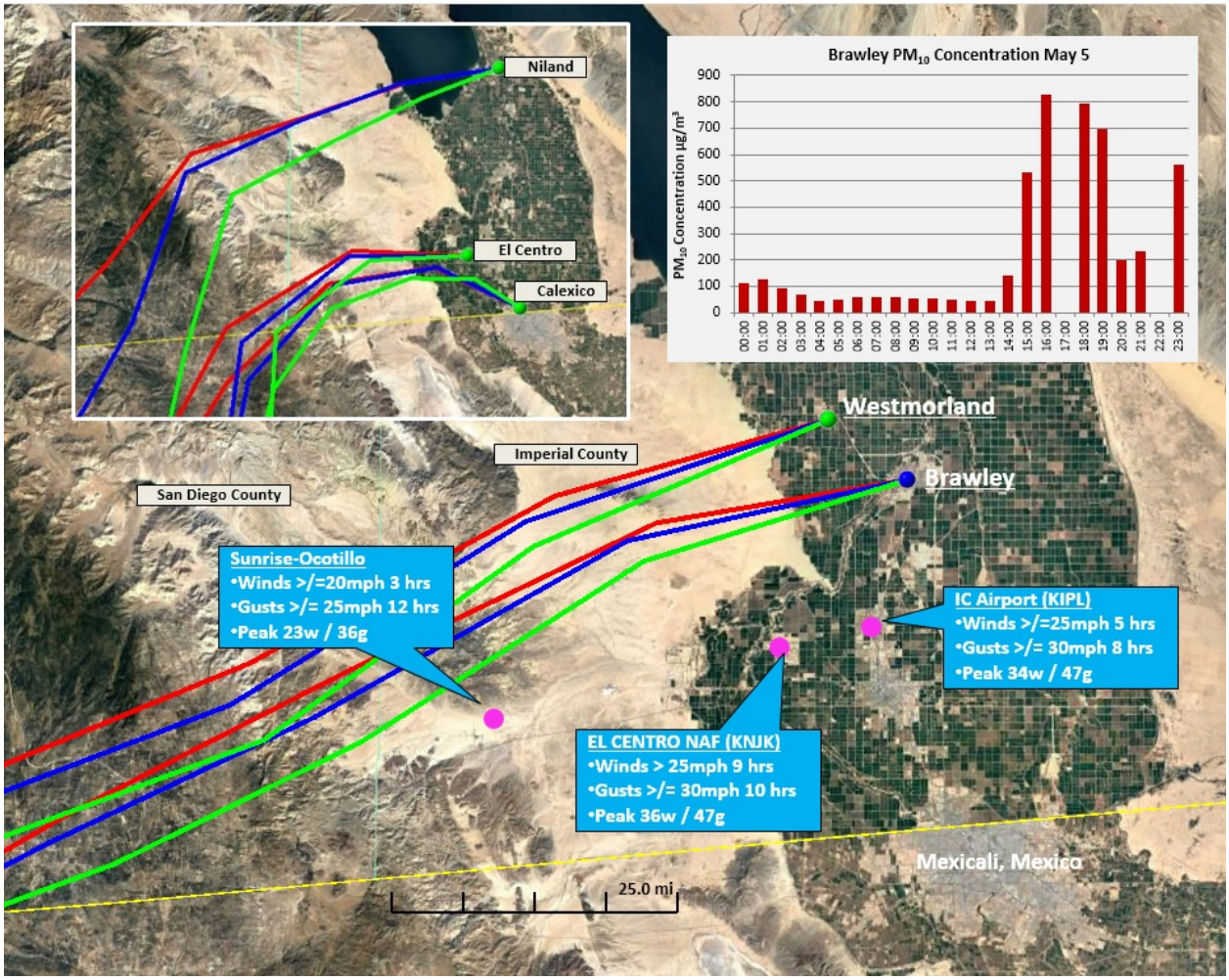

Fig 5-3: Gusty westerly winds upstream of the Brawley, Westmorland and Niland monitors transported windblown dust that resulted in an exceedance on May 5, 2014. Niland, measured elevated concentrations that would have resulted in a violation had instrument flow levels not failed proper operating protocols causing the invalidation of 6 hours of measured concentrations. In all likelihood, Niland would have exceeded the NAAQS. Air quality data from the EPA's AQS databank. Wind data from the NCEI's QCLCD database and the University of Utah's MesoWest data bank

FIGURE 5-4
EXCEEDANCE FACTORS MAY 6, 2014

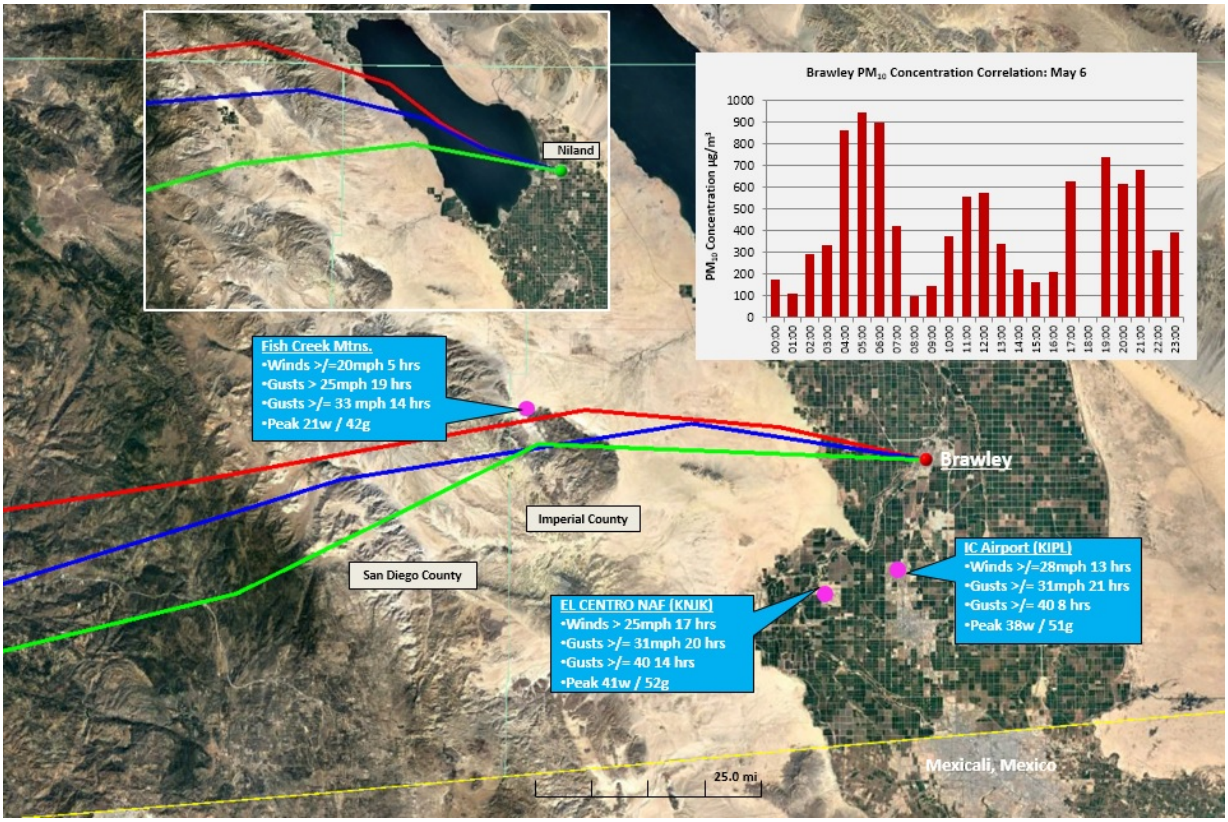

Fig 5-4: The strong gusty westerly winds transported windblown dust over the San Diego mountain passes, into the natural open deserts, over agricultural lands affecting the Brawley and Niland monitors on May 6, 2014. Airflow, as evidenced by the trajectories for Niland took a northerly route while at Brawley the airflow remained similar to the May 5, 2014 pattern. Like May 5, 2014, the Niland monitor failed to function correctly causing the invalidation of 12 hours of measured concentrations. In all likelihood, Niland would have exceeded the NAAQS. Wind data from the NCEI's QCLCD database and the University of Utah's MesoWest data bank. Air quality data from the EPA's AQS data bank

Figure 5-5 is an illustration of the wind speeds throughout Imperial County beginning with May 4, 2014 and ending May 7, 2014. The consistency for all stations is evident. For May 5, 2014, all stations measured elevated wind speeds as early as 1500 PST. As the system moves, inland wind speeds elevate throughout May 6, 2014. All sites illustrate a common pattern throughout May 5, 2014 and May 6, 2014.

FIGURE 5-5
WIND SPEEDS NEIGHBORING SITES

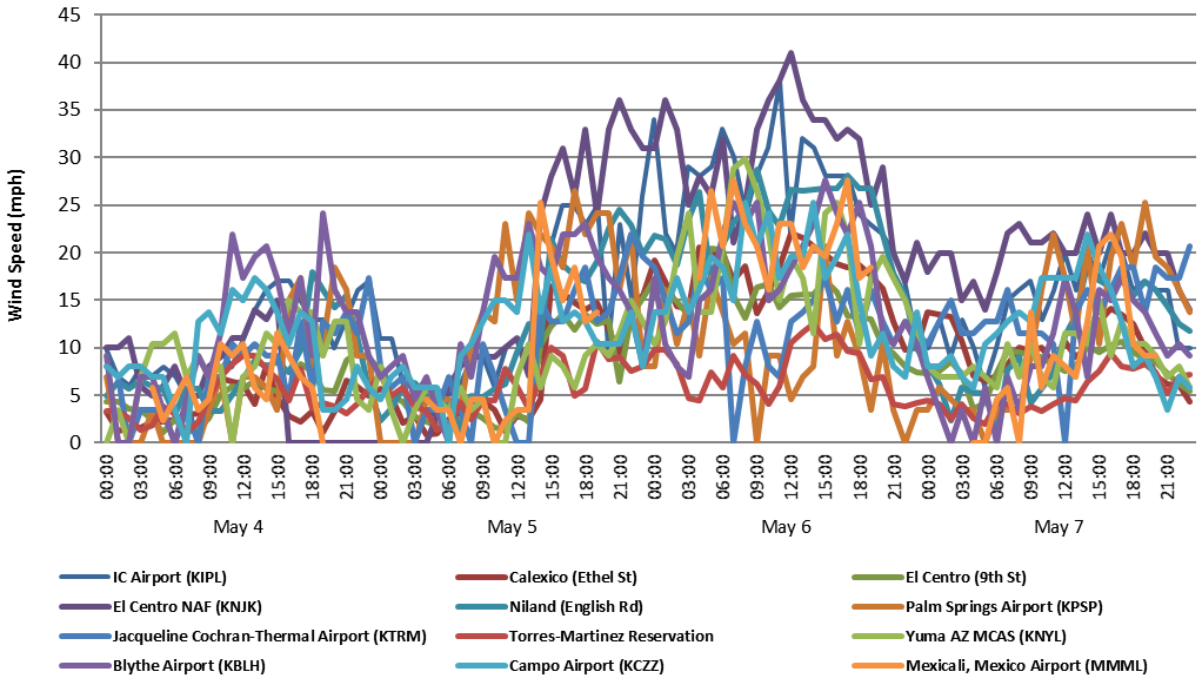

Fig 5-5: Meteorological data collected from twelve sites within the Imperial, Riverside, and Yuma Counties over a 4-day period from May 4, 2014 to May 7, 2014 illustrates the regional effect of the elevated gusty westerly winds May 5, 2014 and May 6, 2014. Wind data from the NCEI's QCLCD data base, the EPA's AQS data bank, and the Weather Underground

Figure 5-6 demonstrates the spatial and temporal relationship between the gusty westerly winds and the transported windblown dust on May 5, 2014 and May 6, 2014. The correlation of hourly concentration data from the Brawley monitor and the elevated wind speeds on May 5, 2014 and May 6, 2014 illustrate a correlation between winds and concentrations. The peak hourly PM_{10} concentration occurred throughout the afternoon and evening hours on May 5, 2014, which are associated with the high peak winds and gusts, measured at KIPL and KNJK. The peak PM_{10} concentration on May 6, 2014 occurred during the 0500 PST hour, which follows a period when gusts at both airports were above 40 mph. **Appendix C** contains additional graphs illustrating the relationship between the high PM_{10} concentrations and increased wind speeds from other monitoring sites within Imperial and Riverside Counties on May 5, 2014 and May 6, 2014**.**

FIGURE 5-6
BRAWLEY 48 HOUR PM_{10}
CORRELATION OF CONCENTRATIONS AND WIND SPEEDS

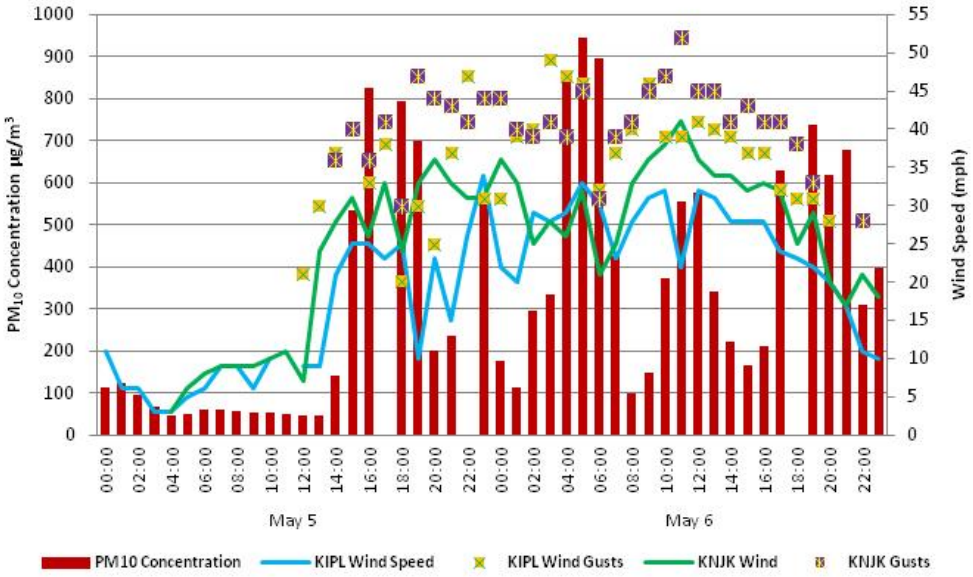

Fig 5-6: Brawley PM_{10} concentrations illustrate a correlation in elevated westerly winds and measured concentrations. Air quality data is from the EPA's AQS data bank while wind data if from the NCEI's QCLCD data bank

Figure 5-7 is a four-day depiction of the PM_{10} concentrations at the Brawley monitor, May 4, 2014 through May 7, 2014. For the morning and early afternoon hours on May 5, 2014, the Brawley station showed lower concentration levels, as winds were light. However, as winds increased during the afternoon, concentrations subsequently rose. PM_{10} concentrations remained elevated throughout the next day on May 6, 2014. As winds returned to relatively light conditions in the early morning hours of May 7, 2014, so did hourly concentrations.

FIGURE 5-7
BRAWLEY 96 HOUR PM_{10}
CORRELATION OF CONCENTRATIONS AND WIND SPEEDS

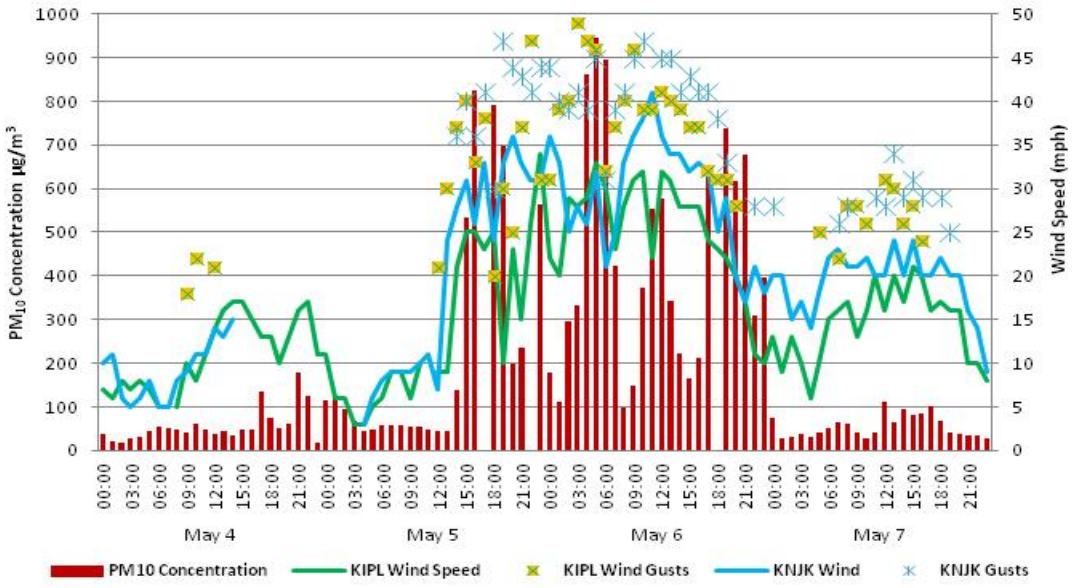

Fig 5-7: This graph illustrates the correlation between the elevated westerly winds and measured concentrations for four days, May 4, 2014 through May 7, 2014 for the Brawley monitor. Imperial Airport (KIPL) and El Centro NAF (KNJK) wind data utilized. Air quality data from the EPA's AQS data bank and wind data from the NCEI's QCLCD data bank

In order to understand the totality of the regional effect, **Figures 5-8 and 5-9** provide supporting information regarding the regional nature of the two-day event. There is a correlation between the elevated PM_{10} concentrations, elevated wind speeds, wind gusts and reduced visibility. Blowing dust affected visibility on May 5, 2014 and May 6, 2014. As winds slowly reduced to calm conditions during the early morning hours of May 7, 2014, concentrations similarly reduced. **Appendix C** provides additional graphs that illustrate the correlated relationship between the high PM_{10} concentrations and elevated wind speeds from other monitoring sites providing evidence of the effect upon air quality in Imperial County on May 5, 2014 and May 6, 2014 qualifying the event as a natural event**.**

FIGURE 5-8
CONCENTRATIONS OF NEIGHBORING SITES

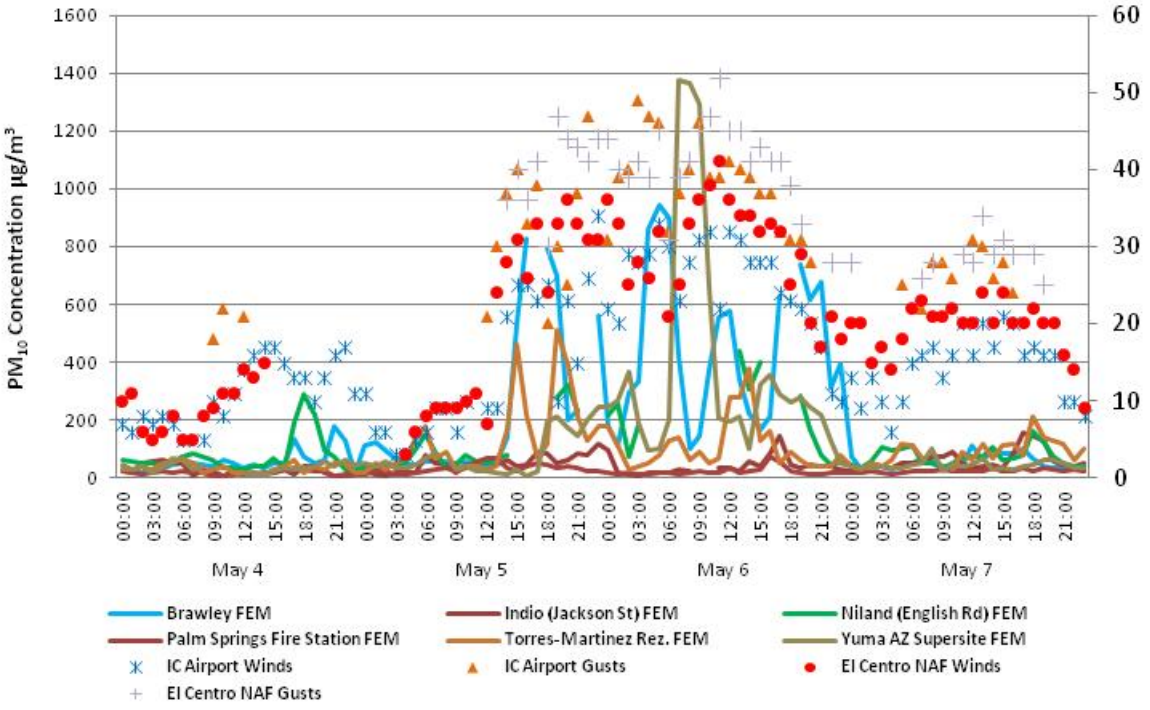

Fig 5-8: This graph illustrates the concentration levels at monitoring sites (including the Brawley monitor) located to the north and to the east of the Brawley monitor for the day before, the days of the event and the day after the event. All monitors show a comparable pattern between the elevated wind speeds and PM_{10} concentrations supporting that the event affected air quality in Imperial County. Air quality data from the EPA's AQS data bank and wind data from the NCEI's QCLCD data bank

FIGURE 5-9
72 HOUR TIME SERIES PM_{10} CONCENTRATIONS AND VISIBILITY

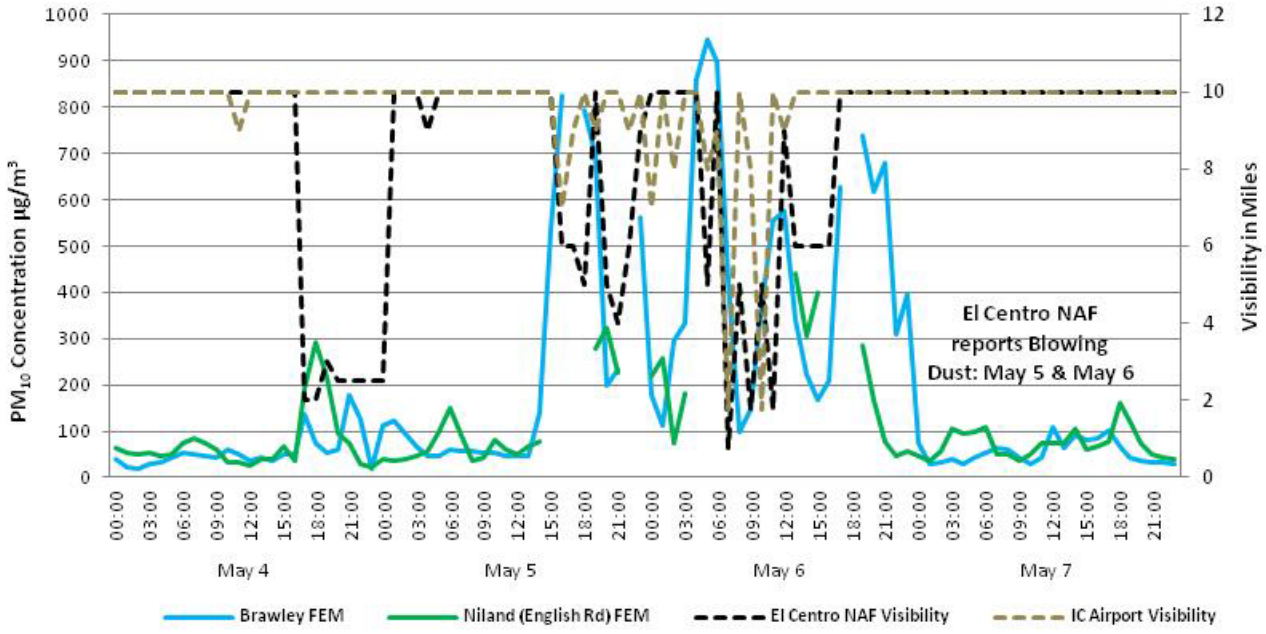

Fig 5-9: Illustrates the relative visibility level on May 5, 2014 and May 6, 2014. Reduced visibility, caused by blowing dust, coincided with increased PM_{10} concentrations at both the Brawley and Niland monitors. El Centro NAF (KNLK) observed blowing dust on several occasions on May 5, 2014 and May 6, 2014. Hours represent the period in with the visibility reading was taken, and not necessarily the precise time. Air quality data from the EPA's AQS data bank and visibility data from the NCEI's QCLCD data bank

As mentioned above, the anticipated arrival of the late season trough prompted the NWS to issue no less than 20 separate notices in the form of Urgent Weather Messages, Hazardous Weather Outlooks, Local Storm Reports, Rain Fall Totals, and Public Information Statements. These notices contained Wind Advisories, Blowing Dust Advisories, High Wind Warnings, and measured highest observed wind gusts. A useful measured of the degradation of air quality is the Air Quality Index (AQI).[18] Because hourly measured concentrations are required to calculate the AQI no AQI information is available for Westmorland on May 5, 2014 and May 6. 2014.

[18] The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health affects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country.

Figures 5-10 and 5-11 provide the resultant Air Quality Index (AQI)[19] for May 5, 2014 and May 6, 2014. As the late season trough moved south into SoCal on May 5, 2014 the level of reduced air quality can be ascertained when the AQI goes from "Yellow" or moderate level to an "Orange" or unhealthy for sensitive groups. Similarly, on May 6, 2014 as the weather system moves inland the level of reduced air quality can be ascertained when the AQI begins at a "Red" or unhealthy level to a "Maroon" or hazardous level. As the preceding winds affect Imperial County on May 5, 2014, windblown dust causes elevated concentrations and reduced air quality. As the weather system, moves inland and the gusty westerly winds increase the saturation of windblown dust upon the air monitor causes significantly reduced air quality. **Appendix A** contains copies notices pertinent to the May 5, 2014 and May 6, 2014 event.

FIGURE 5-10
AIR QUALITY INDEX FOR BRAWLEY MAY 5, 2014

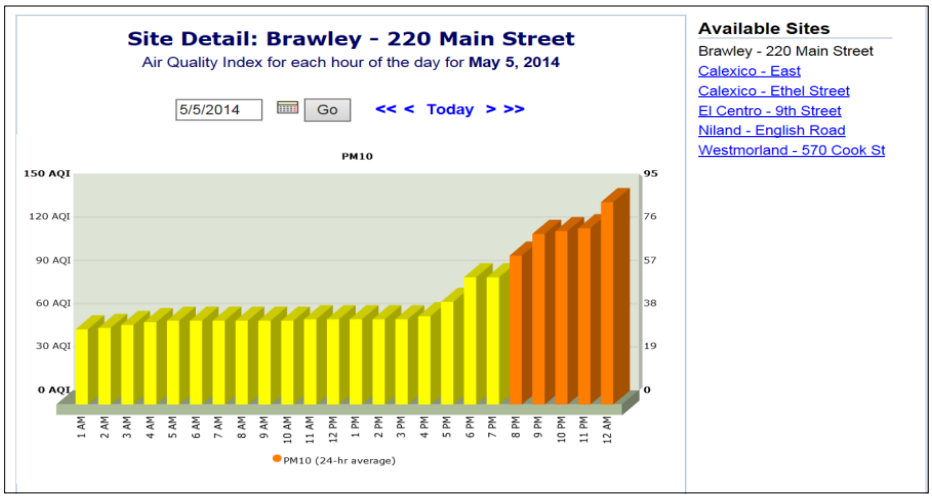

Fig 5-10: Reduced air quality is evident when warnings go from a moderate level to an unhealthy level for sensitive groups (Yellow to Orange)

[19] The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country.

FIGURE 5-11
AIR QUALITY INDEX FOR BRAWLEY MAY 6, 2014

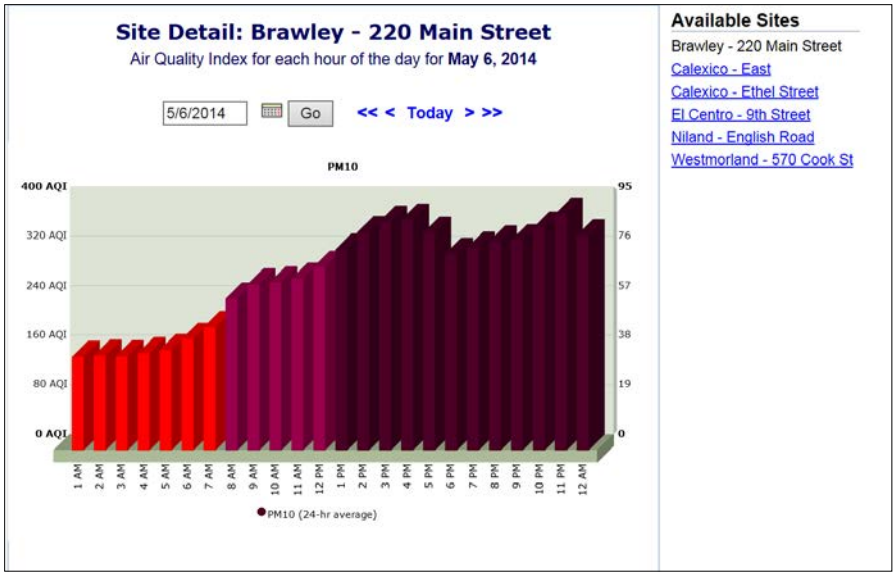

Fig 5-11: Reduced air quality is evident when warnings go from an unhealthy level to a hazardous level (Red to Maroon)

TABLE 5-1
WIND SPEEDS AND PM_{10} CONCENTRATIONS FOR BRAWLEY MAY 5, 2014

CALEXICO				EL CENTRO NAF				IMPERIAL COUNTY AIRPORT				NILAND				BRAWLEY FEM	
																	5/5/2014
HOUR	W/S	W/G	W/D	HOUR	W/S	W/G	W/D	HOUR	W/S	W/G	W/D	HOUR	W/S	W/G	W/D	HOUR	PM_{10} ($\mu g/m^3$)
0	6		286	0	8		289	0	12			0	2		186	0	113
100	5		303	100				100	11		300	100	4		67	100	124
200	2		319	200				200	6		310	200	6		100	200	94
300	3		321	300				300	6		320	300	6		119	300	66
400	1		276	400				400	3		180	400	5		117	400	44
500	1		146	500	3			500	3		240	500	6		113	500	48
600	2		157	600	6		200	600	5		200	600	4		108	600	58
700	3		165	700	8		180	700	6		210	700	1		162	700	58
800	5		156	800	9		180	800	9		210	800	5		251	800	57
900	4		134	900	9		170	900	9		190	900	5		222	900	52
1000	3		132	1000	9		220	1000	6		170	1000	6		197	1000	54
1100	1		118	1100	10		150	1100	10		230	1100	6		196	1100	47
1200	3		174	1200	11		140	1200				1200	10		194	1200	45
1300	3		151	1300	7		120	1300	9		200	1300	13		183	1300	45
1400	5		306	1400	24		250	1400	9	21	250	1400	10		243	1400	139
1500	16		295	1500	28	36	250	1500	21	30	260	1500	21		268	1500	532
1600	16		291	1600	31	40	260	1600	25	37	260	1600	19		271	1600	825
1700	15		297	1700	26	36	260	1700	25	40	260	1700	18		269	1700	
1800	14		300	1800	33	41	260	1800	23	33	260	1800	17		276	1800	792
1900	15		299	1900	24	30	270	1900	25	38	250	1900	19		268	1900	698
2000	12		290	2000	33	47	250	2000	10	20	290	2000	23		267	2000	199
2100	9		323	2100	36	44	250	2100	23	30	300	2100	25		268	2100	234
2200	15		309	2200	33	43	260	2200	15	25	300	2200	23		272	2200	
2300	15		310	2300	31	41	260	2300	27	37	270	2300	20		267	2300	563

Table 5-1: Wind speed, wind gust, and wind direction tables for Calexico, El Centro NAF, Imperial County Airport and Niland comparative to the concentrations measured at the Brawley monitor on May 5, 2014. Values indicated in red are wind speed values coincident with the Brawley monitor measured PM_{10} concentrations above 100 $\mu g/m^3$. Collected meteorological observations are from a variety of sources with varying equipment and exposure. **Appendix B** contains additional information regarding meteorological observations

TABLE 5-2
WIND SPEEDS AND PM_{10} CONCENTRATIONS FOR BRAWLEY MAY 6, 2014

CALEXICO				EL CENTRO NAF				IMPERIAL COUNTY AIRPORT				NILAND				BRAWLEY FEM	
																	5/6/2014
HOUR	W/S	W/G	W/D	HOUR	W/S	W/G	W/D	HOUR	W/S	W/G	W/D	HOUR	W/S	W/G	W/D	HOUR	PM_{10} ($\mu g/m^3$)
0	19		294	0	31	44	250	0	34	47	260	0	22		274	0	177
100	17		296	100	36	44	250	100	22	31	260	100	21		272	100	111
200	14		301	200	33	40	250	200	20	31	260	200	19		260	200	295
300	14		303	300	25	39	260	300	29	39	260	300	24		263	300	332
400	21		293	400	28	41	260	400	28	40	270	400	26		257	400	860
500	20		296	500	26	39	250	500	29	49	270	500	17		259	500	945
600	20		286	600	23	37	260	600	33	47	260	600	21		256	600	896
700	17		296	700	21	31	250	700	30	46	250	700	23		260	700	423
800	19		296	800	23	33	250	800	23	32	250	800	25		258	800	98
900	14		309	900	33	41	250	900	28	37	240	900	29		257	900	147
1000	16		287	1000	36	45	240	1000	31	40	260	1000	24		264	1000	374
1100	18		284	1100	38	47	250	1100	32	46	270	1100	23		267	1100	554
1200	22		283	1200	37	43	260	1200	22	39	260	1200	27		263	1200	575
1300	22		278	1300	36	45	250	1300	32	39	250	1300	27		261	1300	341
1400	21		284	1400	34	45	260	1400	31	41	250	1400	27		258	1400	222
1500	20		284	1500	34	41	250	1500	28	40	250	1500	27		257	1500	166
1600	19		275	1600	32	43	240	1600	28	39	260	1600	27		257	1600	210
1700	18		271	1700	33	41	240	1700	28	37	250	1700	28		255	1700	629
1800	19		267	1800	32	41	240	1800	24	37	250	1800	27		257	1800	
1900	18		266	1900	25	38	250	1900	23	32	250	1900	27		257	1900	737
2000	16		269	2000	29	33	250	2000	22	31	250	2000	22		261	2000	618
2100	13		274	2100	20		250	2100	20	31	250	2100	18		259	2100	678
2200	10		279	2200	17		250	2200	17	28	260	2200	15		258	2200	309
2300	10		287	2300	21	28	260	2300	11		260	2300	10		253	2300	395

Table 5-2: Wind speed, wind gust, and wind direction tables for Calexico, El Centro NAF, Imperial County Airport and Niland comparative to the concentration of the Brawley monitor on May 6, 2014. Values indicated in red are wind speed values coincident with the Brawley monitor measured PM_{10} concentrations above 100 $\mu g/m^3$. Collected meteorological observations are from a variety of sources with varying equipment and exposure. **Appendix B** contains additional information regarding meteorological observations

V.2 Summary

The preceding discussion, graphs, figures, and tables provide wind direction, speed and concentration data illustrating the spatial and temporal effects of the gusty westerly winds that preceded a strong or deep late season trough off the coast of Washington that moved down the west coast on Monday, May 5, 2014 then moved across Southern California on Tuesday, May 6, 2014. The information provides a clear causal relationship between the transported windblown dust and the PM_{10} exceedance measured at the Westmorland and Brawley monitors on May 5, 2014 and May 6, 2014. Furthermore, the advisories and air quality index illustrate the affect upon air quality within the region extending from San Diego, Riverside, Imperial and Yuma counties. Large amounts of coarse particles (dust) and PM_{10} were transported by strong gusty westerly winds into the lower atmosphere causing a change in the air quality conditions within Imperial County. The windblown dust originated from as far as the mountains and desert areas

located in San Diego County, part of the Sonoran Desert. Combined, the information demonstrates that the elevated PM_{10} concentrations measured on May 5, 2014 and May 6, 2014 coincided with strong gusty westerly winds and that strong winds were experienced over the San Diego Mountains and deserts, Riverside County, all of Imperial County, and parts of Arizona.

FIGURE 5-12
MAY 5, 2014 AND MAY 6, 2014 WIND EVENT TAKE AWAY POINTS

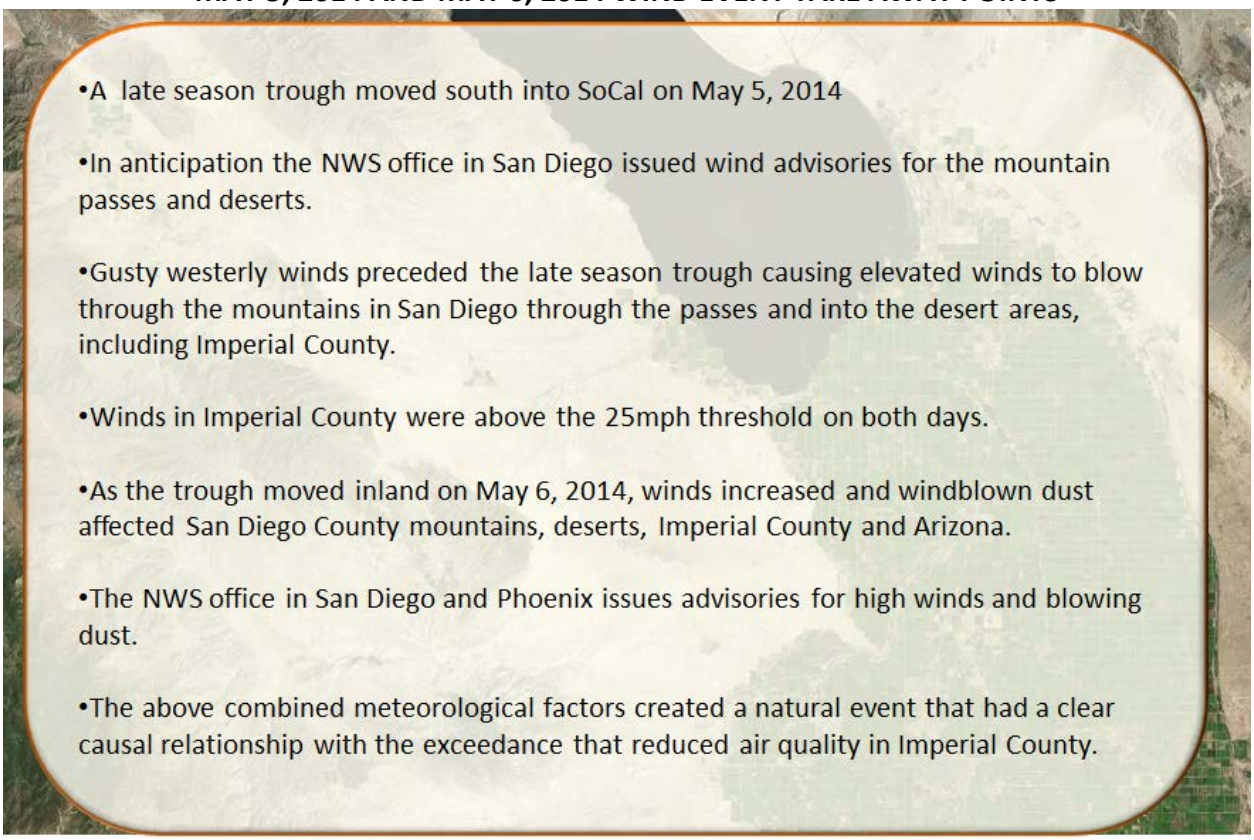

Fig 5-12: Is a summary of the meteorological conditions and facts that qualify the May 5, 2014 and May 6, 2014 event, which affected air quality as an Exceptional Event.

VI Conclusions

The PM_{10} exceedance that occurred on May 5, 2014 and May 6, 2014, satisfies the criteria of the EER, which states that in order to justify the exclusion of air quality monitoring data evidence must be provided for the following elements:

TABLE 6-1 TECHNICAL ELEMENTS CHECKLIST EXCEPTIONAL EVENT DEMONSTRATION FOR HIGH WIND DUST EVENT (PM_{10})		DOCUMENT SECTION
1	A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s)	6-30
2	A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation	21-30; 46-64
3	Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) of this section	31-40
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	41-48
5	A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event	6-64

VI.1 Affects Air Quality

The preamble to the revised EER states that an event has affected air quality if the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation. Given the information presented in this demonstration, particularly Section V, we can reasonably conclude that there exists a clear causal relationship between the monitored exceedance and the May 5, 2014 and May 6, 2014 event, which changed or affected air quality in Imperial County.

VI.2 Not Reasonably Controllable or Preventable (nRCP)

Section 50.1(j) of 40 CFR Part 50 defines an exceptional event as an event that must be "not reasonably controllable or preventable" (nRCP). The revised preamble explains that the nRCP has two prongs, not reasonably preventable and not reasonably controllable. A natural wind event, which transports dust from natural open deserts, meets the nRCP, when sources are controlled by BACM and when human activity plays little to no direct causal role. This demonstration provides evidence that despite BACM in place within Imperial County, high winds overwhelmed all BACM controls where human activity played little to no direct causal role. The

PM_{10} exceedances measured at the Westmorland and Brawley monitors caused by naturally occurring strong gusty west winds that transported windblown dust into Imperial County and other parts of southern California from areas located within the Sonora Desert regions to the west and southwest of Imperial County. These facts provide strong evidence that the PM_{10} exceedances on May 5, 2014 and May 6, 2014, were not reasonably controllable or preventable.

VI.3 Natural Event

The revised preamble to the EER clarifies that a "Natural Event" (50.1(k) of 40 CFR Part 50), which may recur at the same location, is an event where human activity plays little or no direct causal role. The criteria that human activity played little or no direct causal role occurs when the event, along with its resulting emissions, are solely from natural sources or where all significant anthropogenic sources of windblown dust have been reasonably controlled. As discussed within this demonstration, windblown dust anthropogenic sources reasonably controlled with BACM in and around Brawley and Westmorland on May 5, 2014 and May 6, 2014 meet the criteria that human activity played little or no direct causal role therefore, the event qualifies as a natural event.

VI.4 Clear Causal Relationship

The time series plots of PM_{10} concentrations at Brawley and Westmorland during different days, and the comparative analysis of different monitors in Imperial and Riverside counties demonstrates a consistency of elevated gusty westerly winds and concentrations of PM_{10} on May 5, 2014 and May 6, 2014 (Section V). In addition, these time series plots and graphs demonstrate that the high PM_{10} concentrations and the gusty westerly winds were an event that was widespread, regional and not preventable. Arid conditions preceding the event resulted in soils that were particularly susceptible to particulate suspension by the elevated gusty westerly winds. Days immediately before and after the high wind event PM_{10} concentrations were well below the NAAQS. Overall, the demonstration provides evidence of the strong correlation between the natural event and the windblown dust emissions to the exceedance on May 5, 2014 and May 6, 2014.

VI.5 Historical Concentrations

The historical annual and seasonal 24-hr average PM_{10} concentrations measured at the Brawley and Westmorland monitors were historically unusual compared to a multi-year data set (Section III).

Appendix A: Public Notification that a potential event was occurring (40 CFR §50.14(c)(1))

This section contains issued notices by the NWS and Imperial County pertinent to the May 5, 2014 and May 6, 2014 event. Along with NWS notices, this Appendix contains any issued air quality alerts. Air quality alerts advise sensitive receptors of potentially unhealthy conditions in Imperial County resulting from a natural event. On May 5, 2014 and May 6, 2014, the data illustrates a region-wide increase in wind speeds and wind gusts coincident with the arrival of dust and high PM_{10} concentrations in Imperial County.

Appendix B: Meteorological Data

This Appendix contains the time series plots, graphs, wind roses, etc. for selected monitors in Imperial and Riverside counties along with other pertinent graphs, time series plots for other areas if applicable. These plots, graphs and tables demonstrate the regional impact of the wind event.

Appendix C: Correlated PM_{10} Concentrations and Winds

This Appendix contains the graphs depicting the correlations between PM_{10} Concentrations and elevated wind speeds for selected monitors within Imperial, Riverside, San Diego, and Yuma counties if applicable. Other areas are also included if applicable such as Mexico. These graphs demonstrate the region wide impact of the wind event.

Appendix D: Regulation VIII – Fugitive Dust Rule

This Appendix contains a description of the compilation of the BACM adopted by the ICAPCD and approved by the USEPA. Seven rules numbered 800 through 806 comprise the set of Regulation VIII Fugitive Dust Rules.